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Topology and the Naming of Complexity (1) (Draft)

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'Today we have naming of parts. Yesterday,
We had daily cleaning. And tomorrow morning,
We shall have what to do after firing. But today,
Today we have naming of parts. Japonica
Glistens like coral in all of the neighbouring gardens,
And today we have naming of parts.'
(Henry Reed, Lessons of the War: 1)

The Naming of Parts

Notoriously, Michel Foucault said of his early work (was it **Histoire de la Folie**?) that it took them fifteen years to find a way of reducing it to a single sentence, whereas in the case of **Volonté de Savoir**, the **History of Sexuality**, it took them only fifteen days. Perhaps, then, we are lucky. The naming of 'the theory of the actor-network' took more than fifteen days and its contraction to 'ANT' took even longer. For the accolade of the three letter acronym is a mixed blessing. Yes, it is the contemporary academic equivalent of the Imperial Triumph, the glorious return to Rome. Yes, it is a good moment to rest, to bask in the glory. Perhaps it is a good moment return to the Paris chart-rooms and plan the subjugation of the next barbarian province. For the naming of the theory, its conversion into acronym, its rapid displacement into the textbooks, the little descriptive accolades - or for that matter the equally quick rubbishings - all of these are a sign of respectability.

But if it is possible to build reputations this way, then the naming of 'ANT' surely also sets alarm bells ringing. As, also, does the ease of its displacement. For the act of naming suggests that its centre is easily fixed - has been fixed and rendered definite. That it has been turned into a specific strategy with an obligatory point of passage, a definite intellectual place.

There are many metaphors for telling this. Deleuze and Guattari talk of arborescence and rhizome (2). And of territoriality versus nomadism; or lack against the intensities which grow from within. No doubt we need to be wary of romanticism, to avoid the idea that freedoms and productivities are located in boundlessness and boundlessness alone (3). In the breaking of names and fixed places. Yes, there are dangers.

But then again. The naming, the fixity and the triumphalism - I want to argue that in current circumstances these pose the larger danger to productive thinking. To the chance to make a difference, intellectually, politically. My desire is to escape this multinational monster, 'actor-network theory'. I do not wish to defend it against its critics. Because, well, because this is not an interesting thing to do. Because it is not productive to defend a more or less-singular fixed point which is performed, in part, by the fact of its naming. Because it is not a good way of making a difference. Under current circumstances intellectual inquiry is not, should not be, like that. And, of course, actor-network theory was never really like that.

Yes, you note the irony. The paradox is upon us. By talking in this way I make a fixed point in order to argue against fixity and singularity. I do so because I turn myself into a spokesperson for this name, the theory of the actor network, ANT. I seek to tell you how it really is.

Well, I am going to have to live with this paradox because I want (as they say) to make progress, and I need to make it quickly. I want to make some claims about actor-network theory, what it really is because, I also want to commend some possibilities that don't have to do with triumphalism and expansion. That don't have to do with fixed points. That rather have to do with displacement, movement, dissolution, and fractionality.

Actor-Network Theory Was ...

First story.

Actor network theory is a ruthless application of **semiotics**. It tells that entities take their form and acquire their attributes as a result of their relations with other entities. In this scheme of things entities have no inherent qualities: essentialist divisions are thrown on the bonfire of the dualisms. Truth and falsehood. Large and small. Agency and structure. Human and non-human. Before and after. Knowledge and power. Context and content. Materiality and sociality. Activity and passivity. In one way or another all of these divides have been rubbished. Let's not underestimate the shock value, nor indeed the potential for scandal here (4). Sacred divisions and distinctions have been tossed into the flames. Fixed points have been pulled down and abandoned. Humanist and political attachments have been torn up. Though, of course, it is a little more complicated, and the scandal may sometimes be more metaphysical than practical. For this precise reason: it is not, in this semiotic world-view, that there **are** no divisions. It is rather that such divisions or distinctions are understood as **effects or outcomes**. They are not given in the order of things.

There is much that might be said about this. Much ink has been spilled, for instance, about the importance of the distinction between human and non-human (5). Or, for that matter, the machinic and the corporeal. But I don't want to get into the set-piece debates. Instead, I simply want to note that actor-network theory may be understood as a semiotics of materiality. It takes the semiotic insight, that of essential relationality, and applies it ruthlessly to all materials - and not simply to those that are linguistic. Which suggests (and there is nothing more enjoyable than teasing Bruno) first that it shares something important with Michel Foucault's work. Second, that it may be usefully distinguished from those versions of post-structuralism that attend to language and language alone. And third (if one likes this kind of narrative) that it expresses the ruthlessness that has often been associated with modernity, at least since Karl Marx talked of the way in which 'all that is solid melts into air.'

Relational materiality: this catches, this names, the point of the first story.

The second story has to do with **performativity**. For the semiotics tell us that entities achieve their form as a consequence of the relations in which they are located. But this means that it

also tells us that they are **performed** in, by, and through those relations. A consequence is that everything is uncertain and reversible, at least in principle. It is never given in the order of things. And here, though actor-network studies have sometimes slipped towards a centred and no-doubt gendered managerialism (more on this in below), there has been much effort to understand **how it is** that durability is achieved. How it is that things get performed (and perform themselves) into relations that are relatively stable and stay in place. How it is that they make distributions between high and low, big and small, or human and non-human. Performativity, then, this is the second name, the second story about actor-network theory. Performativity which (sometimes) makes durability and fixity. And, for that matter, subjects and objects that are relatively stable and durable.

Actor-Network Theory Became ...

Two stories, two forms of naming. **Relational materiality**. And **performativity**. The two, of course, go together. If relations do not hold fast then they have to be performed.

But what of the naming of 'actor-network theory'. Time for an origin story. Obviously, the term started in French. I think I remember Michel Callon asking me 'Comment est-ce qu'on pourrait traduire 'acteur reseau' en Anglais?' Yes, I told him, to talk of the 'actor-network' would be fine. And then it seems that the term took on a life of its own. For first the talk had been of 'enrolment'. Or even more so of 'traduction' or 'translation'. But, like some kind of monster, the term 'actor network' grew, and it started, like a theoretical cuckoo, to throw the other terms out of the nest. Which, with the privilege of hindsight, seems both significant and ominous.

'Actor-network'. This is a name, a term which embodies a **tension**. It is **intentionally oxymoronic**. The tension, of course, lies between the centred 'actor' on the one hand and the decentred 'network' on the other. In one sense the word is thus a way of performing both an elision of, and a difference between, what Anglophones like to call 'agency' and 'structure'. A difference, then, but a difference which is, at the same time a form of identity.

There is much to be said about this, about this notion of the 'actor ..... network'. Yes, actors are network effects. They take the attributes of the entities which they include. They are, of course, precarious. But how is the network assembled? Here there are answers, but many of them lead us into Macchiavellian or managerialist difficulties. Or they are posed in a language of strategy. No doubt the sacred texts of ANT are more complex and oxymoronic than this quick naming suggests. However, if we draw on a set of discourses that have to do with strategy, then the gravitational pull of those discourses is primarily about the struggle to centre - and the struggle to centre and order from a **centre**. As we know, this may be told in a number of ways.

- One: yes we are all heterogeneous engineers, says Leigh Star, but heterogeneity is quite different for those that are privileged and those that are not (6).

- Two: we may talk of 'heterogeneous strategies' or 'heterogeneous engineering'. But what about **non**-strategic orderings? What about relations that take the shape or form that they do for other reasons (7)?

- Three: materials may be heterogeneous, but what of heterogeneity in the sense intended by a writer like Jean-François Lyotard? Heterogeneity, in one way or another, as Otherness, that which is unassimilable? As difference? Whatever has happened to this (8)?

Perhaps then, the ordering of 'actor .... networks' tends to ignore the hierarchies of distribution, it is excessively strategic, and it colonises what Nick Lee and Steve Brown call the 'undiscovered continent' of the Other (9). Perhaps it tends to suck the tension out of the term 'actor ..... network'. To defuse its oxymoronic charge. All this is well known, reflections of the problem of agency. But there are other problems, for instance to do with the term 'network'. For this is deceptively **easy to think**. We live, or so they tell us, in 'social networks'. We travel using the 'railway network'. And, as historians of technology remind us, we are surrounded by 'networks of power' (10). But what are we doing when we use such a vocabulary? What metaphorical bag and baggage does it carry?

No doubt there are various possibilities. Marilyn Strathern asks us to attend to the links between notions of network and the assumptions built into Euroamerican notions of

relatedness (11). Another (indeed linked) way of tackling the issue is to think topologically. Topology concerns itself with spatiality, and in particular with the attributes of the spatial which secure continuity for objects as they are displaced through a space. The important point here is that **spatiality is not given**. It is not fixed, a part of the order of things. Instead it comes in various **forms**. We are most familiar with Euclideanism. Objects with three dimensions are imagined to exist precisely within a conformable three dimensional space. They may be transported within that space without violence so long as they don't seek to occupy the same position as some other object. And so long as their co-ordinates are sustained, they also retain their spatial integrity. In addition they may be measured or scaled. They may be piled on top of one another.

All of this is intuitively obvious.

Another version of Euclideanism is that of regionalism. Here (and again the point is obvious) the idea is that the world takes the form of a flat surface which may then be broken up into different kingdoms and principalities of varying sizes. Regionalism, then, is a world of areas with its own topological rules about areal integrity and change.

Arguably, these topological understandings underpin many of the discourses and practices of the socio-technical. But studies of exotic societies suggest that there are other spatial possibilities (12) - and so too does actor network theory. Indeed, the notion of 'network' is itself an alternative topological system. For in a network, elements retain their spatial integrity **by virtue of their position in a set of links or relations**. Object integrity, then, is not about a volume within a larger Euclidean volume. It is rather about holding patterns of links stable. Which is, of course, what Bruno Latour is pointing to when he speaks of immutable mobiles (13).

So, and I thank Annemarie Mol for this observation, we may imagine actor-network theory as a machine for waging war on Euclideanism: as a way of showing, **inter alia**, that regions are constituted by networks. That, for instance, nation states are made by telephone systems, paperwork, and geographical triangulation points. It isn't the only literature that does this: one thinks, for instance, of writing in the new space between geography and cultural studies (14). However, posing the point generally, actor-network theory articulates of some of the possibilities which are opened up if we try to imagine that the sociotechnical is **topologically non-conformable**; if we try to imagine that it is topologically complex, a location where regions intersect with networks.

Of course it is not the only such attempt. When Deleuze and Guattari talk of 'the fold' they are also wrestling with the idea that relations perform or express different and non-conformable spatialities. And indeed there are more than a few people at this meeting who are precisely interested in complex spatialities (15). But - big but - **this sensibility for complexity is only possible to the extent that we can avoid naturalising a single spatial form, a single topology**.

How does all this relate to the notion of the network? I think there are two possibilities. One is to insist, robustly, that the term is indeed relatively neutral, a descriptive vocabulary which makes possible the analysis of different patterns of connection which embody or represent different topological possibilities. This is indeed a perfectly sustainable position, and no doubt one that underpins the co-word approach to scientometrics (16). The alternative is to say, as I have above, that the notion of the network is itself a form - or perhaps a family of forms - of spatiality: that it imposes strong restrictions on what we might think of as the conditions of topological possibility. And that, accordingly, it tends to limit and homogenise the character of links, the character of invariant connection, the character of possible relations, and so the character of possible entities.

In the present context this is the position that I want to press. Let me say this carefully. Actor-network is, has been, a semiotic machine for waging war on essential differences. It has insisted on the performative character of relations, and the objects constituted in those relations. It has insisted on the possibility, at least in principle, that they might be otherwise. Some, perhaps many, of the essentialisms that it has sought to erode are strongly linked to topology, to the logic of space, to spatiality. They are linked, that is, to volumetric or regional performances of space. Examples here would include many versions of scale, of big and small, and (again in their many regional versions) such alternates as human and non-human,

or material and social. So actor-network theory has indeed helped to destabilise Euclideanism: it has shown that what appears to be topographically natural, given in the order of the world, is in fact produced in networks which perform a quite different kind of spatiality.

But. Yes, but. It has been incredibly successful. Successful to the point where **its own topological assumptions have been naturalised**. Which, if you take the position that I'm pressing, has had the effect of limiting the conditions of spatial and relational possibility. And, in particular, of **tending to homogenise them**.

So this is the sceptical diagnosis. When it started to think about relations, actor network theory set off with a notion of translation. Translation: the process of making two things that are not the same, equivalent (17). But this term translation tells us **nothing at all about how it is that links are made**. And, in particular, it assumes nothing at all about the similarity of different links. Back at the beginning of actor network the character of semiotic relations was thus left open. The nature of similarity and difference was left undefined. Topologically - or in any other way. Which means, no doubt, that it might come in many forms. Or, to put it differently, there was **no assumption that an assemblage of relations would occupy a homogeneous and conformable space** - no assumption that it would be singularly tellable, visible from a distance, a specific vantage point (18).

Yes: I believe that the naming has done harm as well as good. The desire for quick moves and quick solutions, the desire to know clearly what we are talking about, the desire to point and name, to turn what we now call ANT into a 'theory', I believe that all of these things have done harm as well as good. 'Have theory, will travel.' Easy use of the term 'actor-network' has tended to defuse the power and the tension originally and oxymoronically built into the expression. And the further abbreviation, ANT, removes this productive non-coherence even further from view. The blackboxing and punctualising that we have witnessed as we have named it have made it easily transportable. They have made a simple space through which it may be transported. But the cost has been heavy. We have **lost the capacity to apprehend complexity**, Lyotardian heterogeneity.

You'll see, then, that what I am trying to do is to attack simplicity. Or a notion of theory that says that it is or should be simple, clear, transparent. The performance of smoothness, this is a mixed blessing, both theoretically and politically. The last time I was in this room I listened to Marilyn Strathern talking about audit in the context of university teaching and research. One of the things that she had to say was that transparency is not necessarily a good. She said of teaching students (I paraphrase): 'Sometimes it is good to leave them puzzled, uncertain about what is being said. Even confused.' She was, I think, questioning the assumption which is embedded in the practice of teaching audit, at least in the United Kingdom, that clarity about aims and objectives is a good in and of itself. That it is **possible** to make explicit, in as many words, what one is on about. What a topic is all about. This assumption means, of course, that one way of failing in (British) teaching is to be unclear about the purpose of what one is doing. Or to leave the students with undefined questions in their minds.

No doubt teaching audit is a peculiarly British disease. But the point is more general. It applies, or so I am arguing, to **thinking theory**, or **thinking research**, just as much as it does to thinking teaching. For as we practise our trade as intellectuals, the premium we place on transportability, on naming, on clarity, on formulating and rendering explicit what it is that we know - this premium, though doubtless often enough appropriate, it also imposes costs. And I am concerned, indeed obsessed, by those costs. I believe that they render complex thinking - thinking that is not strategically ordered, tellable in a simple way, thinking that is lumpy or heterogeneous - difficult or impossible.

Fractionality

The title of our workshop is 'actor network and after'. The prospectus which John Hassard, Martin Parker and I wrote for the meeting emphasises that arguments 'for' actor network theory - and, to be sure, arguments 'against' it - are not very interesting in and of themselves. What **is** interesting, we argued, is rather matters, questions, issues arising. Places to think, places from which to move on. Places from which to make a difference.

One of the most important matters arising has, I put it to you, to do with complexity. It has to do with complexities that are lost in the process of labelling. This, I want to insist, is an analytical **and** a political matter. **Naming does work**. It does analytical work. But it also does political work, a work of distribution, of allocation. Which is what happens when we speak, for instance, of 'actor network **theory**'.

And what is the nature of that work, the work of labelling? We know the answer. It strains to perform simplicity. It pushes towards singularity. It tends to make relative fixity. And it helps to perform the possibility of unsituated transportability. Which is in tension with, and tends to countermand, other performances, performances of specificity, location, and yes, diaspora. For actor-network (and here, no doubt, it is like everything else) is diasporic (19). It spreads, and as it spreads it translates itself into **many** things that are new and different from one another. Into a range of different practices which, no doubt (for this is the point of talking of translation) also absorb, diffract and perform other practices, other concerns: from cultural studies; social geography; organisational analysis; feminist STS.

But if actor-network theory is diasporic, its parts different from one another, they are also **partially connected**. And this, of course, is another way of talking of the problem of naming, the problem of trying to discern or impose the 'ANT'-ness of ANT. Or, indeed, any of the single-line versions of actor-network theory, the 'have theory, will travels' which now populate the literature.

The point, then, is both theoretical and political. For these attempts to convert actor-network theory into a fixed point, a specific series of claims, of rules, a creed, or a territory with fixed attributes, also strain to turn it into a singularity. Into a strongpoint, a fortress, which has achieved the double satisfaction of clarity and self-identity. These performances are powerful - we live in the slip-stream of the perfect vision of the Enlightenment - and they make their own conditions of possibility. But they are also a nonsense for, to the extent that it is actually alive, to the extent that it does work, to the extent to which it is inserted into intellectual practice, to the extent that it is embodied here and there, this thing we call actor-network theory also transforms **itself**. Performs partialities. Local specificities. Which means that there is no **credo**. Only dead theories and dead practices celebrate their self-identity. Only dead theories and dead practices hang on to their names. Insist, like clones, upon their perfect reproduction.

So, no, there is, there should be, no identity. No fixed point. Despite the performances that surround us, the world is not a homogeneous medium in which perfectly whole subjects manipulate objects that are equally clear, transparent and singular. Enlightenment dream, Enlightenment nightmare. But then again (and this is the point of talking about complexity) neither is an approach like actor-network theory simply a random set of bits and pieces, wreckage spread along the theoretical hard shoulder. But how to **say** this? How to **talk** about something, how to name it, without reducing it to the homogeneity and fixity of singularity? How to talk about objects (like theories) that are more than one and less than many? How, yes, to **talk about** complexity? To **appreciate** complexity? To **perform** complexity? Theoretically? And politically?

I take it that these are the most important questions which we confront. How to deal with and fend off the simplicities implicit in a world in which: 'Have theory, will travel' makes for easy intellectual and political progress. How to resist the singularities so commonly performed in the acts of naming and knowing. How to defy the overwhelming pressures on academic production to render knowing simple, transparent, singular, formulaic. How to resist the pressure to enact, yet again, the God-trick.

Well, the 'after' in the 'actor network and after' holds out promise. And that is in no small measure due to the efforts of the people in this room. Donna Haraway and Marilyn Strathern talk of **partial connections** (20). Donna also tells stories about cyborgs and prostheses, about internal but irreducible connections which perform the oxymoronic diffractions of situated knowing (21). Bruno Latour and Michel Callon have taught us about translation. Translation, to remind ourselves, is always betrayal. To join two things, to make them identical, is also an act of treachery - for there is no such thing as identity. Annemarie Mol and Kevin Hetherington find ways of telling topological complexity, of performing the double vision that is necessary if there is no single place from which everything can be seen. Bob Cooper

talks of heterogeneity and deferral, of the labour that is involved in making division (22). Nick Lee and Steve Brown tell stories of Otherness. There is, in these and related ways of telling theoretical stories, a great metaphorical power-house, a set of metaphors in tension, metaphors which make complexity and resist simplicity. Metaphors which resist the call to turn themselves into theories which may be summarised and travel easily. Metaphors which do not seek to perform themselves out of time and space. Out of situation.

But - and again I borrow from Marilyn - the metaphor with which I would like to conclude is that of the **fractal**.

Let me restate the problem. The objects we study, the objects in which we are caught up, the objects which we perform, are always **more than one and less than many**. Let me repeat that: they are **more than one and less than many**. Actor-network theory is merely an example. Yes, it is more than one but neither is it simply a random heap of bits and pieces. Which means that it is **neither** a singularity nor a plurality. Singularity and plurality, this is the dualism that we need to try to avoid, a dualism that is written into and helps to perform vicious limits to the conditions of intellectual and political possibility. A dualism which also helps to define what will count as simple, and what is taken to be impossibly complex. What is possible and what is impossible (23).

Which is why I like to work with the metaphor of the fractal. A fractal is a line which occupies more than one dimension but less than two. So a fractional object? Well, this is something that is indeed **more than one and less than many**. Somewhere inbetween. Which is difficult to think because it defies the simplicities of singularity - but also the corresponding simplicities of pluralism. That defies a singular universe, visible from a single place, that is inhabited by separate objects. So the thinking is difficult - no, it is not transparent - precisely because it **cannot** be summed up and reduced to a point. Rendered conformable. Docile. Because it insists on the situated character of knowing. Because it strives to perform something that is difficult.

Is it too dramatic to say that despite the best efforts of many of its practitioners actor-network theory has been broken on the altar of transparency and simplicity? Of rapid transportability? I don't know. At any rate, the God eye is alive and well and seemingly incurable in its greed for that which is flat and simple and may be easily brought to the point. It is greedy in the performance of its own invisibility. But, or so I firmly believe, the best chance of making differences that are good lies elsewhere. It lies in the performance of irreducibility. In the oxymoronic. In the topologically discontinuous. In that which is heterogeneous. It lies in a modest willingness to live, to witness, to know, and to practice in the complexities of tension.

Notes

Note 1: To resist the demands of simplicity one needs friends. Here are some of those friends: Brita Brenna, Michel Callon, Bob Cooper, Mark Elam, Donna Haraway, Kevin Hetherington, Bruno Latour, Nick Lee, Annemarie Mol, Ingunn Moser, Bernike Pasveer, Sandy Stone, Marilyn Strathern, Sharon Traweek and Helen Verran. I thank them all.

Note 2: Developed, in particular, in (Deleuze and Guattari: 1988).

Note 3: A point which Ingunn Moser and I explore through empirical materials about dis/ability. See (Moser and Law: 1997).

Note 4: If anyone needs reminding, consider the reception accorded to Michel Callon's article on scallops and fishermen. See (Callon: 1986).

Note 5: See, for instance, the acrimonious exchange in (Pickering: 1992).

Note 6: See (Star: 1991).

Note 7: Although she presents this in somewhat different terms, this is one of the concerns of Annemarie Mol in her work on the problem of difference. See (Mol: 1997).

Note 8: This was one of the objects of the ethnography of managers reported in (Law: 1994). On heterogeneity see (Lyotard: 1991).

Note 9: See (Lee and Brown: 1994).

Note 10: The term is Thomas Hughes'. See (Hughes: 1983).

Note 11: See (Strathern: 1996).

Note 12: See (Strathern: 1991).

Note 13: As discussed in (Latour: 1987).

Note 14: Two rather different examples here would be (Harvey: 1989) and (Jameson: 1991).

Note 15: See (Brown and Capdevila: 1997), (Cussins: 1997), (Hetherington: 1997b), (Lee and Stenner: 1997), (Mol and Law: 1994) and (Strathern: 1991).

Note 16: I think it is implied in the 'co-word' approach to scientific indicators. For a recent example of this approach see (Boettger: 1997).

Note 17: This, I've always thought, is in certain respects a little too limiting. Equivalence? Why equivalence? But perhaps in the present context this isn't so important.

Note 18: There is much to be told about vision and the performance of visibility. See, for instance (Alpers: 1989; Bryson: 1983; Hetherington: 1997a; Latour: 1990; Law and Benschop: 1997).

Note 19: I explore this point in greater detail in (Law: 1997b).

Note 20: The term appears in Donna Haraway's important but often misunderstood essay, (Haraway: 1991), and is explored in (Strathern: 1991).

Note 21: See (Haraway: 1997).

Note 22: See (Cooper: 1989); this paper is reprinted in (Hetherington and Munro: 1997).

Note 23: It is also strongly related - and this is also a most important analytical and political point - to another division, between myth and reality. Reality performs itself as a singularity: a single outside world, about which we may have more or less adequate knowledge. It then becomes possible to categorise knowledges as more or less adequate. Or, more strongly, it becomes possible to treat certain knowledges as mythical - as having little or no bearing on reality. But if one adopts the performative approach to knowing implicit in semiotics, and imagines that knowledges interact with and help to produce not only knowing subjects but also apprehended objects, then the division disappears, to be replaced by a continuum. Under these circumstances a politics of mythmaking becomes attractive: the performance of myths that may subsequently tend to realise themselves by virtue of those performances. I take it that this is what Donna Haraway is attempting in parts of her writing - and in particular her re-invention of the 'cyborg'. It is also what I have sought to do in recent work on technological projects. See Haraway (Haraway: 1991; Haraway: 1997; Law: 1997a).

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