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## Objects, Spaces and Others

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### Introduction

#### What is an object?

In its original form ANT has a specific and distinctive answer to this question. It proposes that *an object is an effect of an array of relations*, the effect, in short, of a network. And that it holds together, it is an object, while those relations hold together and don't change their shape. This approach is inspired by a post-structuralist version of semiotics. Semiotics, in the European de Saussurian version of synchronic linguistics, argues that the significance of a term depends on its relations, and specifically the relations of difference between a term and its neighbours. Dog, cat. Each of these terms achieves its significance by virtue of its difference from the other. And then other related but different terms. Dog, cat, wolf, puppy. And so on. So the significance of the term is, as they say, 'arbitrary', though it is also highly determined by the network of relations of difference. It is indeed a relational effect.

A potted history of this relational understanding of the significance of terms would need to trace it through structuralism and into post-structuralism in order to locate ANT. Structuralists usually argued that the arbitrary nature of language reveals something universal about the operations of the human mind. We simply structure relations in the particular ways that we do by virtue of the machinery in our heads. At this level, then, all languages have the same deep structure. By contrast, post-structuralism argues that there are *different* deep structures underpinning and being performed in different social locations which then make different



classes of objects – and different knowledges of those object – available as possibilities. This is visible in Michel Foucault's analysis of the body. In the classical epistème the body is a site for the enactment of symbolic power relations (for instance in the form of torture), while in the modern epistème it is turned into a functional and (self) disciplined machine, a structured set of ordered and productive relations. Foucault thus identifies different 'deep strategies' for ordering relations(1).

ANT is similar – but also different. It is similar in its commitment to materiality. Speech, bodies and their gestures, subjectivities, and materials such as architectures, ships, aircraft or firearms, all are performances of strategic logics. All participate in holding everything together. All are made in, and help to produce, those relations. But it is different because it is less concerned – perhaps even unconcerned – with the limits to the conditions of possibility set by modernity, instead exploring the particular strategies recursively and productively embedded in the relations that make up objects, organisations, subjects, and all the rest. In ANT there are many possible 'modes of ordering' in modernity, not just one.

What should we make of the difference between Foucault and ANT? If we say that objects are simply relational contingencies within ANT then it is primarily an empirical matter as to how they grow up and how the relations which produce them stabilise themselves. This in turn means that in ANT the possibilities of the world are constrained, but contingently, and since the world may produce all variety of things: their orderings do not come in big blocks. But how to think about this? Is it a good way of thinking? Option one: it may be seen as a liberation from Foucault's dark obsession with the limits to the conditions of possibility. From his preoccupation with the way in which we have been almost invisibly imprisoned for the last two hundred years in the logics and the strategies of the modern epistème (2). But there is another option: for perhaps it can also be seen as a form of blindness. In which case ANT is involved in an intellectual and political refusal to try to squint beyond the possible. To find, to make, the undiscovered continent and discover the shady and heterotopic places, the places of Otherness that lie beyond the limits of the current conditions of possibility (3).

It's with this debate about alterity that I want to engage. My question is: *what is an object if we start to think seriously about alterity?* This is a topic that could be tackled in a variety of ways. But here I'll do so spatially – and more particularly topologically. The argument will fall into four major parts.

- First, I will argue that the making of objects indeed has spatial implications; and then, that spaces are not self-evident and singular, but that there are *multiple forms of spatiality*. This is an essential move if we are to treat the alterity of objects in spatial terms.
- Second, I will suggest that objects perform *spatial conditions of im/possibility*. That spatialities are brought into being, enacted, with the objects which are located within them. That there are limits to these im/possibilities. And (following the first point) that these spatial im/possibilities are multiple in character. The possibility of alternative spatialities is also an essential move if we are to make a spatial link between objects and alterity. What are those spatialities? There are various possibilities, but they include regions, networks and fluids.
- And third, I will try to show that in important respects these *spatialities and the objects which inhabit and perform them are unconformable*, that they are Other to one another. And that that objectness is a reflection and performance of that unconformity, the shift between different spatial im/possibilities. This, as is obvious, is a crucial argument if alterity is to be understood, in part, as an expression of spatial difference.

## The Portuguese

I want to start with a well-worn empirical example, the technologies of the Portuguese imperialist expansion (4). As is well known, Iberian maritime technologies – new vessels and new navigational techniques – played a crucial role in the early history of European colonial domination. Christopher Columbus notoriously arrived in central America in 1492, and Vasco da Gama reached the coast of India in 1498. Descriptions of the vessels involved in these early forms of imperialist domination point to



- their *adaptability* (small vessels could be rapidly re-rigged to suit different wind conditions);
- their substantial *carrying capacity* (large versions of the vessels were indeed capacious);
- their relative *impregnability to attack* by boarding (even if the attackers could get on board they were met on the main deck with withering fire from the castles fore and aft);
- the relatively *small size of their crews* (which unlike rowed vessels meant that they could stay at sea for months);
- their capacity to *navigate far from land* and so to take best advantage of prevailing winds and currents. (This was a consequence of adapting old astrological and astronomical observational technologies to life at sea, which meant that semi-literate sailors could hope to determine the latitude of their vessel with some degree of precision.)

The picture, then, of the early Portuguese and Spanish expansion is one in which the great vessels – Carracks – set out to sea, returning, if they did return, up to eighteen months later with spices or looted gold . ‘If they did return’ because, whatever the success of this new maritime technology with its novel vessels and newly-adapted navigational techniques, often enough the vessels foundered along the way, got lost, or their crews died of scurvy and tropical diseases. As the Portuguese put it, ‘If you want to learn how to pray, go to sea.’

### ANT on Objects

What is the ANT analysis of this technology? I presented the answer above. Unsurprisingly, it pictures it as a network. Note that this is an analysis that can be applied to different levels of scale. For instance, a *vessel* can be imagined as a network: a network of hull, spars, sails, ropes, guns, food stores, sleeping quarters – not to mention its human crew. On the other hand, if one turns up the magnification, then the *navigational system* – its Ephemerides, its astrolabe or quadrant, its slate for calculations, its charts, its trained navigator, not to mention its stars, recruited to the system and playing their role – can also be treated as a network. Then again, one can turn down the magnification and think about (say) the Portuguese *imperial system as a whole*, with its ports and entrepôts, its vessels, its military dispositions, its markets, its merchants and its principles as a network in which things more or less stayed in place.

Objects. There are many objects here. But this is the ANT argument: an object (let’s think of a vessel) is an object so long as everything stays in place. So long as the relations between it and its neighbouring entities hold steady. The navigators, the Arab competitors, the winds and the currents, the crew, the stores to feed the crew, the guns: if this network holds steady then so does the vessel. It doesn’t founder, turning into matchwood on some tropical reef. It doesn’t get seized by pirates and taken to the Arabian Sea. It doesn’t sail on, lost, until the crew are broken down by disease and hunger. The vessel *is an effect of its relations with other entities*, and the ANT analysis explores the strategies which generate – and are generated by – its object-ness. Which secure it. The syntaxes or the discourses which hold it in place rather than revealing its essential fragility and its dissolution.

Bruno Latour offers an interesting version of this story, and one which will become important as we think about spatiality. He talks of objects such as vessels (though the description applies equally well to electronic messages passing round the globe, or travellers, or letters in the postal service) as *immutable mobiles* (5). Mobile, yes, because they move around, from Lisbon to Calicut, or New York to Sydney. And immutable because they hold their form, their structure. They hold together as a network. Here, then, the network-ness of the metaphor works in two ways, at two of the scale levels mentioned above. The immutable mobiles are *themselves* a network, an array. They *are* objects. But they also pass down or through a network, held in an array of secure and stable surroundings as they move around. If the circuit is broken –if there is interference – then the packet, the array, the signal, the ship, the letter starts to degrade. It loses its form. It turns into something else.



## Introducing Topology

All of this is classic ANT. Slightly less classic is the idea that when objects are constituted then spatial relations are simultaneously being performed. Of course Latour's term 'immutable mobiles' introduces the notion of movement, and therefore of movement through space. I will return to this below. For the moment I want to argue that the notion of network – or more precisely, an analysis which imagines the creation of objects in network terms – is not spatially neutral, but also implies the production of a particular kind of space (6). To make this argument I will make a brief detour into topology.

Topology is a branch of mathematics which explores with the character of possible spaces. These would include what we tend, common-sensically, to think of as 'space' – which is Euclidean, Cartesian or regional in character. But there are many other – indeed limitless – possibilities. So how does this work? The answer is that topologists think about spatiality by asking questions about the *continuity* of shapes. And such related issues as their *proximity* or relative location.

On continuity: the question here is how an object (or more precisely a shape) can be moved through space while still retaining the essential relations which secure its continuity as that shape. Which permit it to move without distortion. So what counts as 'essential'? What is it that has to be sustained? Rendered continuous? What is a distortion? Well, that is precisely what is at stake in topology. And it doesn't pre-judge the answers. For topology is a mathematical game which explores the possibilities and properties of different forms of continuity – and the different spaces which express or allow those continuities. And there is, at least in principle, an indefinite number of ways of defining what will count as (spatial) continuity. An indefinite number of ways of describing the movement of objects whilst securing their (essential) continuity. An indefinite number of corresponding spaces. And as a part of all this, an indefinite number of ways of measuring proximity or distance.

So how might this apply to the Portuguese vessels?

## Cartesian and Non-Cartesian Spaces: Or What is a Ship?

The most obvious form of space is Euclidean or Cartesian. In this version of spatiality shapes retain their continuity, their singularity, if a set of Cartesian co-ordinates remain stable relative to one another as they, the shapes (but think, too, of objects) are displaced through time and space. For instance: a vessel remains a vessel, the same vessel if it holds together physically as it moves around the seas: topologically speaking, if the set of relative co-ordinates which describe its shape as an object occupying Euclidean space are not disrupted. And the distance travelled by the vessel, or its proximity to other occupants of Euclidean space, is similarly defined in terms of Cartesian co-ordinates.

This is relatively straightforward. But ANT plays, albeit more often implicitly than explicitly, with an alternative conception of spatiality. For, if we ask what it is that secures the continuity of a shape within a network logic the answer comes back in the form I have described above: *a shape, an object, is stable and singular if it is configured within a stable set of links with other entities. Within a stable grammar or syntax of those links.* Hull, spars, sails, stays, stores, rudder, crew, water, winds, all of these entities (and many others) have to be held in place, so to speak *functionally*, if we are to be able to point to an object and call it a ship (7). A properly working ship. One that sails round the globe and trades in spices. All these bits and pieces have to do their jobs. All have (as ANT sometimes puts it) to be enrolled. And they have to stay enrolled. So the ship, to be a properly working ship, has to borrow the force of the wind, the flow of the current, the position of the stars, the energy of the members of the crew, it has to borrow all these and include them (so to speak) within itself.

Now notice this. A working ship is, yes, a continuous *Cartesian* object, a constant set of Cartesian co-ordinates – for the relative positions of important Cartesian co-ordinates are held fixed as it moves through Cartesian space. The relative positions of the prow, the keel, the stern, the masts and the spars, these do not change all that much. On the other hand, however, it is *also* a constant and continuous *network* object, a 'network shape'. Which means, as I have just said, that the relative syntactical and functional positions of the other entities which contribute to the vessel are held constant. That they perform in a way which contributes to the coherence of the vessel. And then, of course, to its movement.



To summarise:

- first, the vessel, the object, is *spatially or topologically multiple*. It inhabits (I am going to add that it also performs) two forms of space. The Cartesian, and the syntactical or semiotic. Two forms of spatial objectness.
- second, it is *invariant* within each of the forms of space. It holds together in both. Physically, in Cartesian space, and functionally or syntactically in semiotic or network space.
- third, however, *it moves only within Cartesian space*. By contrast, it is immobile within network space. There is no change in the relations between the different components. If there is, then something is going wrong. It is no longer a network object.
- fourth, it is this precisely this *immobility within network space which affords its displacement within Cartesian space*. That allows it to sail successfully from Calicut to Lisbon with its cargo of spices.

This is an anatomy of Bruno Latour's notion of 'immutable mobile'. We have learned that *immutability* belongs to network or syntactical space while the *mobility*, a Cartesian attribute, becomes possible because of network immutability. A quick version of the lesson, then, is that if objects displace themselves then this may be *because* they are topologically complex. Because they exist within different spatial topoi. Or, more precisely, because they work, in one way or another, to perform interferences between different topoi. Indeed, though I risk trying to run before I can walk, I want to suggest that *objects may be defined as intersections between performances of shape-invariance within different topological systems* (8).

## Spatialities are Performed

Now I need make a more difficult point about the *production* of spatiality. We have, I guess, a tendency to want to say that the vessel, the object, exists *within* Euclidean space. To work, in other words, on the assumption that the space within which it subsists pre-exists the shape of the vessel, its own particular co-ordinates. That Cartesian space and its co-ordinate system *define* the conditions of im/possibility within which Euclidean objects can exist, exert identity and continuity, and experience proximity or distance. This is certainly the overwhelming sense which derives from Euro-American common-sense. That space comes before us. That it is a neutral container within which our bodies (or Portuguese vessels) happen to exist.

This is not exactly wrong. No doubt there are Euclidean spatial configurations which pre-date particular objects in that space. It is, however, also possible to make another argument: to say that the performance of an object-shape as stable and continuous in Cartesian terms also helps, at the same time, to *perform* a space, a world, that is Cartesian in form. Indeed topologically, the two arguments are closely related if not identical. Thus in the mathematics, to invent objects (or shapes) and define what will count as continuity in displacement is simultaneously to invent or define the spatial conditions of im/possibility. Which suggests that to perform, continuity and identity or to measure distance in terms of Cartesian co-ordinates is also to enact Euclidean space – to help to define the conditions of spatial im/possibility within which objects subsist.

Euro-American common sense renders this indigestible primarily, I think, because it is not particularly aware of the *work* of producing that space. So that spatiality has become reified. History plays a role here. If Euclidean spatiality has been enacted in the past then the sense of space – that this is a container which came before us within which we exist – is indeed justified. While the sense of the contributing enactment gets lost. But it is here that ANT, perhaps more by luck than good judgement, is particularly helpful. In the first instance this is because it is easier to sense the force of the argument about the enactment of space if we move from Cartesian to network or syntactic space. And this, in turn, is because what one might think of the engineering involved in building that space, the fact that it *is* performed, is much more visible for network than Cartesian space. Indeed this is old ANT territory, arguably what it is best adapted to do, with its studies of the heterogeneous engineering involved in building a network that will, indeed, sufficiently hold together to generate an actor-network with its objects. Its analysis of the strategies for securing syntactic invariance. The tactics which ensure the circulation of immutable mobiles, the creation of structures of relations



which will ensure, for instance, that the laws of Newton will (as Bruno Latour notes) stay the same shape in both London and Lagos. Structures of relations which are, indeed, perilous and uncertain.

The ANT argument, then, is that when a (network) object is performed, so, too, a (network) world is being enacted. *But a network world is a topos*. It is a set of spatial im/possibilities which defines the invariance of shapes as they are displaced (9).

### Networks Make Regions Make Networks

But that is just the first step, the ladder that we will need in due course to kick away. For, yes, if we link the conditions which produce objects in an actor-network analysis to a topological sensibility, the idea that network space is being made along with the objects that it contains becomes more obvious. But it is also more complicated because network analyses also intersect powerfully with the formation of Euclidean or regional spatiality, as has been noted within ANT – but also by such critical geographers as David Harvey (10).

Part of this argument is relatively straightforward. It is that *volumes* (for instance vessels), *regions* (for instance countries) and *measurements of distance* (for instance from Lisbon to Calicut) *get made by network means*. For instance, boundaries and distances are generated in surveys by painstaking means with a bunch of more or less specialist tools. And they depend on the work of trained surveyors who know how to use theodolites, to measure angles between trig points, to take accurate records of the angles between those points and who are able to transport records back to a cartographic centre where they can be arrayed on a two-dimensional surface where they can be set against the known distance of some base-line. At which point it becomes possible to draw a map – for instance of the boundaries of a nation, to know how far it reaches. Or a chart of the relative relations of Portugal and India in Cartesian space (11).

Annemarie Mol has observed that ANT is a machine for doing war on regions. More precisely, it is a machine that undermines the naturalness of regions. Renders them less than self-evident. Reveals that Cartesian conditions of spatial im/possibility are not given in the order of things. For it is through this detour that it becomes apparent that it is not only networks, network shapes and objects, and network spaces that get enacted, but also, by analogy that Cartesian space is also a performance. Or the consequence of a series of enactment of stable shapes – when stability is defined in terms of invariant relative Cartesian co-ordinates. Enactments which take place at least partially in network space.

But if networks help to perform regional spaces – if regions depend on networks – then do networks subsist in and of themselves? Are they, as the ANT theorists have tended to assume, spatially autonomous? The answer is going to be no. For several reasons. It is, for instance, possible to argue that network-objects depend on enactments in addition to topoi, topological possibilities. I will come to this in a moment. But more straightforwardly, it is also possible to see that the creation of network-objects at least often depends on object-constancy in Euclidean or Cartesian space. Think again of the Portuguese vessels. As we have seen, these are network-objects, constituted within the invariances defined by syntax. An invariant array of elements which extends far beyond what we usually think of when we think of a vessel. But they are *also* objects constituted within Euclidean or Cartesian space. Give or take, *a vessel is only a syntactically invariant shape if it is also an invariant Euclidean shape*. And here is the rub. *To generate network invariance it is also necessary to work in Euclidean space*. To make an object, a vessel-shape, whose relative Cartesian co-ordinates are constant.

But what are the implications of saying this? Two initial suggestions:

- First, the old unspoken ANT view, an hierarchical view – that somehow network-objects and network-spatiality underpin Euclidean-objects and Euclidean-spatiality – is misleading, because the interference between the two objects and their spatialities is one that is reciprocal.
- And second it suggests, as I intimated earlier, that in order to make an object in one topos, it may be necessary to operate, to work, in another topos. Or, perhaps even more



strongly, that *objects are always performed in a multi-topological manner*, and are dependent for their constancy on intersections between different topoi.

## The Bush-pump is a Fluid Technology

What, then, might one imagine in the form of additional topoi?

Here's another empirical case: the Zimbabwe bush pump. In an exemplary paper Marianne de Laet and Annemarie Mol describe this as a *fluid technology* (12). They say this because it, the bush pump, is not very stable, an instability which expresses itself in a number of different ways. For instance, its *boundaries* seem pretty fluid. De Laet and Mol:

'For what is the Zimbabwe Bush Pump? A *water-producing device*, defined by the mechanics that make it work as a pump. Or a *type of hydraulics that produces water* in specific quantities and from particular sources? But then again, maybe it is a *sanitation device* – in which case the concrete slab, mould, casing, and gravel are also essential parts [to keep out contaminated water JL]. And while it *may* provide water and health, the pump can only do so with the *Vonder Rig* [for drilling wells JL] and accompanied by manuals, measurements, and tests. Without these it is nothing, so maybe they belong to it too. And what about the *village community*? Is it to be included in the pump – because a pump has to be set up by a community and cannot be maintained without one? But then again: perhaps the boundaries of the Bush Pump coincide with those of *the Zimbabwean nation*. For in its modest way this national bush pump helps to make Zimbabwe as much as Zimbabwe makes it. (13)'

If the *boundaries* of the pump are fluid, then what makes it *work* also turns out to be pretty fluid. In terms of the mechanics, bolts – essential because they hold the pump to its mounting, or the handle to the pump – turn out not to be needed. There are pumps that work perfectly well in their absence. Leather seals are replaced with bits of old tyre – which may work just fine. Perhaps there *is* a core to the pump – some parts that are essential – but if so then what that core is constantly being undermined. Its limits are uncertain. The 'essential' mechanics often turn out not to be essential.

And if we think of the pump as a device for supplying pure water? This, again, is fluid. Sometimes it has to do with an *E.coli* count: less than 2.5 micro-organisms per 100 ml of water. But not always. Various complexities. First, there may be ten times the level of *E.coli* without any signs of disease. It depends on who uses the pump. Second, water from the pump may be contaminated, but much less so than alternative water supplies – in which case it is also a working pump in a less than trivial sense. Third, there may be no facilities for measuring bacterial contamination of water. In which case the absence – or the relative absence – of disease is the only indicator of purity left. And without disease then the pump becomes a device which works to supply pure water.

The arguments about the fluid nature of the pump go on. If it is a device for building village communities (which is part of Zimbabwe government policy), then is this a stability? The answer is: no. Sometimes, indeed often, village communities are mobilised and performed in the creation and maintenance of a pump. But sometimes they aren't. So it may turn out that if the future of a pump is to be secured it needs to be adopted by a smaller collectivity – for instance a group of families who will look after it. In which case the pump is no longer involved in the version of social engineering initially preferred by the Zimbabwean state. And, more dramatically, there is a strong argument for saying that the fluidity of the pump, its variability, contributes to its success. It shifts and adapts to local circumstances. There is no fixed structure, no basic agenda. As it is installed and used it changes its shape – and works in subtly or not so subtly different ways. Which indeed reflects its originator – who resolutely refuses to accept authorship for the device. De Laet and Mol:

'Morgan, as a promoter of distributed action ... is firm about the necessity of abandoning control. Implementation, he maintains, depends on involving those who will use the pump. It therefore requires room for their methods and insights. Without this, any pump is bound to fail. For, as he says, in water development it is all too common that the new and the foreign does not work, and that 'all that glitters... end[s] up as a rusty heap of useless technology.'



## Fluid Continuity

So the bush pump is an object, but it is a *variable* object. To be precise, *in Euclidean or network space* it is a variable object. It changes its shape. But putting it this way should set the alarm-bells ringing. For the question is, is it 'really' a variable object, or is it rather a constant object, an object that retains its shape, *in some other topos*? And the answer – or so de Laet and Mol are telling us – is yes, it does hold its shape: it is an object that holds its shape in a fluid manner. It is part of – it helps to enact – a fluid topology.

So what would the rules of fluid spatiality look like? How would an object hold its shape while sustaining itself in a fluid world? As a fluid? We can extract four suggestions from the bush pump example.:

First a negative point. It is that *no particular syntax of relations is privileged*. To suggest otherwise would be to re-create a network shape or object. This means that in a fluid, shapes hold themselves constant while new relations come into being. New in what ways? There are at least two possibilities. On the one hand they may be reconfigurations of existing elements, put together in a somewhat novel way. Or on the other, they may include a novel population of elements, a new set of elements. Think of Wittgenstein's notion of family relations, and one has a helpful picture for thinking about fluid continuity.

- But it is also necessary to retain continuity. So the second point is that reconfigured *relations need to reconfigure themselves bit by bit rather than all at once*. Abrupt or revolutionary changes are more likely to look like new shapes. Perhaps the metaphor to think of here is Duhem's raft. If one doesn't want to fall into the water then any attempt to re-build a raft can only be done bit by bit. Duhem was thinking of scientific theory, but rafts are objects and what applies to rafts applies just as well to bush pumps. Obviously if everything is taken apart at the same time the result is dissolution. The loss of shape-continuity. The loss of identity. There is no bush pump but a transition to something different. Something else. Even within the generous regime of a fluid topos.
- The third point, then, also emphasised by de Laet and Mol, is that *no particular boundary around the object-shape is privileged*. Bits may fall off the object. New bits may be joined on to it. But it is not possible to draw a line in the sand – a regional metaphor, a regional performance of topos – and say that beyond this point continuity is lost.
- But, and the fourth point is a complement to this, it is indeed also necessary to insist that there are differences. That *boundaries are indeed possible in a fluid topos*. That at some point differences become important. Perhaps there are two ways of saying this. One is to say that reconfigured relations may reach the point where the shape has simply moved on too much. That whatever it is, it is not what it started out life as. The bush pump has become a bucket pump. Or a set of bits and pieces for tying up cattle. Whatever. Which is, of course, a denial of the limitlessness of flow. Another is to note that limits within a fluid metaphor, the conditions of im/possibility can be worked up in other ways. To observe, for instance, that some fluids are immiscible. Oil and water, notoriously, do not mix. So this is important: to understand that talk of fluid continuity is not a way of saying that anything goes. A fluid topos has its own practices which determine dis/continuity. It is just that they do not coincide with those of Euclidean or network space.

## The Politics of Flow

Some other observations.

First, there is something attractive about the idea of flow – and the notion of a flowing object. The success of the pump depends, as I have already noted, on its adaptability, the fact that it does not insist on shape-continuity in either the network or Euclidean forms of space. The attractiveness of flow is extended to its (non) author, Morgan, who refuses to say that he invented it, refuses to patent it, and in general insists that it was invented and adapted in all sorts of distributed locations.

De Laet and Mol suggest that Morgan is the ideal man, a fluid man – and contrast his unwillingness to capitalise, to turn himself or V&W Engineering (the plant in Harare where the bush pump is manufactured) with the ruthless centring performed by Louis Pasteur as described by Bruno Latour in one of the classic ANT studies (14).





'Morgan creates a non-creator subject, a dissolved self. Not so he will fade away, but in order to get clean water flowing everywhere. Perhaps all this is so appealing to us because it is so far removed from the control-drive of the modern subject – and even further from the shape this subject takes in soldiers, generals, conquerors, and other exemplars of strong and solid authority. Serving the people, abandoning control, listening to *nyangas* [water diviners], going out to watch and see what has happened to your pump: this is not a line taken by a sovereign master. Here we have, instead, a feminist dream of an ideal man.'

This difference – between the modern subject (one might add the modern object) and the non-modern subject/object – is important in a variety of ways. For instance:

- It suggests that *everything that flows is not a fluid*. As we have seen, immutable mobiles are immutable because they retain their shape in network space, but they also move – let me say that they 'flow' – in Euclidean space. This is significant because much if not all of the talk about 'global flows' – information, capital, people – turns out to relate to phenomena that belong to networks and network spaces (together, no doubt, with Euclidean space). They have to do with immutable mobiles. Which tells us that all this talk about flows may be pointing to an important contemporary phenomenon, but that in the first instance it is one that has little or nothing to do with fluid space – a topos which lies beyond its conditions of possibility (15).
- But why is this? One reason is definitional. Following de Laet and Mol, I have simply set up fluid spatiality and its objects in a way that excludes network space and network objects (16). This is a definitional matter. They are, indeed, Other to one another. Fluid possibility is network impossibility. But there is a more specific and sociological way of making the point. It is that *accumulation at a specific location is not consistent with fluid spatiality*. It depends, rather, on a network logic, a logic of strategic aggrandisement. Thus Pasteur created what the ANT theorists call an 'obligatory point of passage'. To save your cows from anthrax you were forced to make a detour through his laboratory, its procedures and its products. You had no choice. As a result the laboratory accumulated resources – a surplus – which might then be re-deployed to increase its location as an obligatory point of passage, a location of capitalisation. All of which is conspicuously what Morgan is trying to *avoid* doing. He is a strategist of non-strategy, if I might put it like that. Which is not to say that the bush pump is not a success. Quite to the contrary. It is very successful. Indeed, it also appears that its fluidity – and its organisational dispersion – is indeed one of the keys to its success. *But it is not a success that brings special rewards to one particular location*. There is no strategic location where there is accumulation. There are no centres and peripheries (17).
- Network space and fluid space are Other to one another. But they also *complement* one another. Thus notwithstanding their enthusiasm for fluid objects and fluid subjects, De Laet and Mol also caution us against becoming unduly romantic about fluidity. It may be that sometimes objects really do need to take network shapes if they are to work at all: Portuguese vessels come to mind. And it is no doubt possible to argue that there is core of stable relations even to the bush pump which represents the enactment of a network topos, something to do with vertical pipes, levers, valves and connecting rods. More generally, the argument made earlier that *objects may be seen as stabilities which arise out of performances of shape-invariances in more than one topos* applies just as much here. The bush pump certainly exists in and enacts Euclidean space, and I've just suggested that it may also in some measure exist in and perform network spatiality. Perhaps, then, we need to say that it shuttles between these different topoi, performing relations between them.
- Finally, however, this complementarity raises questions about the ways in which classes of topological work become *deleted* in accounts (which are no doubt themselves also inserted in specific spatial forms). There, then, are questions about *the topological character of invisible work*.

It is a classic sociological trope that low status work – for instance by manual workers or women – gets deleted in the accounts of the powerful and in the distribution of rewards which secures their privilege. But how might we think about this in the present context? My



suggestion is that it may be treated as an expression of spatial Otherness. Or, more precisely, that it is an expression of spatial Otherness combined with simultaneous and necessary spatial interference. Here is the hypothesis – though we have met it before in more general form: *the invariance of network objects depends on shapes/objects holding themselves constant in fluid forms*. Holding themselves constant in order to supplement the network-work. To secure object-constancy at those moments when networks break down. When the immutable mobiles start to reveal their mutability. I'm suggesting, then, that network objects would not exist without fluid work. Without 'less formal' arrangements.

But (the second part of the argument) *I also want to argue that the logic of network accounting deletes this work*. And that it deletes it and its necessity in a variety of related ways. Here are at least two possibilities.

One: sometimes, and I guess this is most often what happens, it *simply does not see it at all* – as might be the case with the domestic labour which goes to reproduce a labour force, or, one might add, all the fluid ad-hocery necessary to keep a vessel at sea and afloat for an eighteen month return trip to India. Analytically, this is invisible work that is unaccounted and unaccountable precisely because it does not fit within the object-constancy required by and produced for 'proper accounting procedures'. The latter recursively produce (and are produced by) immutable mobiles, objects such as goods, well-disciplined persons, and most especially representations such as figures that can be faithfully drawn together at a centre of accumulation, an obligatory point of passage. Self-evidently, network spatiality produces and depends on such network-objects, objects which secure their constancy in a syntax of consistent functionality. Which means that that which cannot be made into an invariant functional syntax *cannot be represented at the centre at all*. Unstrategically, it flows, as we might say, between the meshes of the network.

- Two: though the endemic status of fluid objects (and subjects) is that they are invisible within the syntax of the network, there are also moments when fluid visibility is achieved. So when is this? How does it work? And does this mean that fluids are not, after all, Other to networks? First the when and the how.

Fluid objects become visible when something goes wrong *from the standpoint of the network*. When an object in the network fails. When, in other words, the syntax of relations that constitute its solidity, its objectness in the network, starts to shift. Examples abound. Wrecked ships. Failing vaccines. And there is a huge literature in STS about the demise of technical objects – for instance like the Challenger disaster, or the Three Mile Island near-meltdown (18). But spatially similar are those moments of what one might think of as 'network-panic' that reveal – or produce – the fact that there has been *unacceptable sloppiness* in the following of procedures. That, for instance, health service professionals, or accountants, or architects or lay people have not followed appropriate protocols. That nurses have participated in operations. That mothers don't put their children to sleep on their backs. That cervical screen laboratories don't follow the appropriate guidelines (19). That rules have been 'interpreted' elastically. The hypothesis, then, is that network panic is a response to a network's own failure to secure syntactical stability – at which point what I am claiming to be the hidden but necessary fluidity of objects to networks becomes both visible and Other as it is, and is represented, as a failure and therefore a threat.

## Alterity and Topological Interference

I noted earlier that in mathematics topology is a game – a game that generates constant spaces by generating different rules about what will count as continuity. I also noted that there is no particular limit to the possible rules that might be generated. But games are serious. No doubt this is true in topology, but it is certainly the case for the spatial heterogeneities of material and social performance. What it is to be an object – and the politics and distributions of the spatialities that go with objects – these are serious matters. And it has been my aim, in exploring these, to interfere and to make a difference to objectness, alterity, and to the spatial limits of the conditions of possible objects.

Actor-network theory, it is clear, tends to set spatial limits to its understanding of objects – and to the topos that these both inhabit and perform. Network space defines its objects in a



particular way and as it does so it undermines the reifications of Euclidean space, revealing the latter and its objects to be enactments. But, as numerous authors have indicated, to the extent that it remains committed to its original network intuitions, it sets limits to its own imagination and helps to perform analogous limits to the conditions of spatial (and political) possibility, turning these into a general potential which defines the character of possible objectness (20). So that is the thrust of the analysis of fluid objects described here: that objects may, and indeed routinely do, maintain their shape in fluid forms which precisely *defy* (but also support) the conditions of network spatiality. And that they may do this in forms which look unregulated, sloppy and sub-optimal – but only in the space of the network. So the argument is that it is often, perhaps usually, wrong to imagine fluid forms as failing networks. To imagine that that if only they could be turned into networks with the possibility of central accumulation, then things would be better. This, at any rate, is what the example of the bush pump suggests.

The aim of the paper, then, has been to denaturalise network-space and network-objects. To show that these too are enacted. And, in particular, to move the agenda on by proposing that *objects are topologically multiple*. That they are intersections or interferences between different topoi – and at the very least between regions, networks, and fluids. So I've argued that *the identity of objects may be understood as an intersection between different versions of shape invariance*. Objects as shapes with Euclidean co-ordinates. Objects as constant grammars or syntaxes. And objects as shifting (but not unlimited) reconfigurations of relations.

So social topology is a deathly serious game. A game to do with interference in which shape-constancy in one topos produces effects – including capitalisation and deletion effects – in another. But this paper is also an interference in the relation between spatialities and their objects (21). If it insists on the multi-topological character of shape then this is also an interference in favour of alterity. Which here, in particular, means that it is an attempt to interfere in the tendency of networks to insist that there is nothing, nothing valuable, nothing firm, beyond the network. For what started as a concern about ANT and its undiscovered continent has by now grown as the metaphor of network has grown and they have been discursively and performatively extended of networks around the globe.

So it is that I end with this proposition. That topoi are *political choices*. They are political choices because they make objects, make subjects, of particular shapes. Because they effect distributions. Because they set limits to the conditions of object – and subject – possibility. Because they generate forbidden spatial alterities. And because – at least in the case of networks – they delete those alterities. Network, then, embodies and performs a politics, a politics linked to and dressed up as functionality. The implication is that to talk of fluids is also to embody and perform a politics. An alternative politics. A politics of object-constancy that does not link functionality to centring, syntactical stability or capitalisation. And as we have seen this politics – this reality – is necessarily Other to the spaces of the network. To its accounts. Which is why it is right, as a matter of political choice to make that interference. To discover objects in their spatial multiplicity and alterity. To make and articulate alternative topoi. Topoi that do not depend on fixed places. Topoi that are unstrategic.

## Endnotes

\* This paper is part of a joint project on spatiality with Annemarie Mol and arises out of nearly a decade of conversation, debate and joint work. I am also most grateful to Claudia Castañeda, Kevin Hetherington, Duncan Law, Ingunn Moser, Vicky Singleton, John Urry and Helen Verran for discussion, support, encouragement, and resistance.

1 See, for instance Foucault (1979).

2 For a particularly interesting analysis of the heterotopic, beyond the limits of the epistémè, see Kevin Hetherington's (1997).

3 A criticism in made one way or another by various writers including Nick Lee and Steve Brown (1994) and Susan Leigh Star (1991).

4 This case study was written up in John Law (1986; 1987)

5 See Bruno Latour (1990).



6 I draw this argument from joint work with Annemarie Mol. See Annemarie Mol and John Law (1994).

7 A sense of the importance of the functional in certain explanatory schemes - here actor network theory - arose for me in conversation with my colleague Claudia Castañeda. I am most grateful to her.

8 This moves the argument several steps forward into speculation. I will shortly make one of those steps slightly less speculative, by arguing that spaces are made together with objects. A second step in the argument would be to say that objects can only be detected in inter-topological interferences.

9 This, to be sure, is why the actor-network theorists sometimes say that nothing exists outside the network - a form of colonialism if ever there was, a way of limiting the conditions of possibility, but if one is confined within a network topology it is also a claim that is nevertheless quite right. For definitionally, network stabilities can only, indeed, exist within a topos of network.

10 See, for instance, David Harvey (1989) and also Nigel Thrift (1996).

11 All of which is explored in the already cited paper by Bruno Latour (1990).

12 The argument outlined here were developed in Annemarie Mol and John Law (1994), and the empirical case is described in greater detail in Marianne de Laet and Annemarie Mol (1999). An analogous multi-topological argument is developed in John Law and Annemarie Mol (1998).

13 From Marianne de Laet and Annemarie Mol (1999).

14 See Bruno Latour (Latour 1988).

15 For an example of the genre see Manuel Castells (1996).

16 The argument was originally developed in Annemarie Mol and John Law (1994).

17 There is much more that might be said about this. No doubt strategies of flexible accumulation represent an intersection between objects that exist both in network and fluid spatialities: it is not simply a matter of the movement of immutable mobiles. But the beast of capitalism does need, no doubt, to accumulate somewhere, even if that somewhere moves around through Euclidean (and even network) space.

18 For an attractive example of the genre see Charles Perrow (1984).

19 The last two examples are drawn from the work of Vicky Singleton. See Singleton (1998); and Anne Grinyer (1999).

20 For further commentary see Donna Haraway (1994) and Marilyn Strathern (1996).

21 I derive the metaphor of interference from the writing of Donna Haraway who, in refusing a dualist division between myth and reality, generates metaphors (such as the notion of the feminist cyborg) that will interfere with what she refers to as the current disorder, perform themselves into partial reality, and so make a political difference. The new topological metaphors - and especially fluid - are introduced here with an analogous aim. In particular, I wish to interfere with the hegemonic pretensions of network metaphors and network spatialities which cannot imagine a world without wishing to control or capitalise on it. See Donna Haraway (1991; 1997).

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