ANT, Multiplicity and Policy[1]

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Introduction

We start with an example of policy in action – a story about foot and mouth disease.

This came to Britain in 2001. Discovered in an abattoir in Essex near London on February 19th, this highly infectious animal condition was traced to a badly run pig farm near Newcastle upon Tyne in the north east of England on February 22nd. But by the time the vets had found it, it had already jumped to sheep on nearby farms, and those sheep, just 19 of them, had been trucked to a huge market at Longtown near the Scottish border. There, and mixed with 24,500 other sheep, they had been sold to 181 buyers from all over the UK. On the 23rd February movements of sheep, cows and pigs across the UK were stopped. But the vets knew that it was too late. On 24th February foot and mouth was discovered in the far south-west of England. Within a week there were nineteen outbreaks. And by the March 4th, two weeks on, there were sixty-seven infected farms across England and Scotland, and this was just the beginning.

It was to take six months to eradicate the disease, it infected two thousand farms, and around six million animals were slaughtered. The outbreak cost the UK government around £3bn, and the total economic cost was around £8bn. The outbreak brought grief and loss to many rural communities; it caused outrage and horror in the cities where the burning pyres of animal carcasses on the nation's TV screens became an icon of the disaster.[2] Along the way, as the epidemic continued to grow through the later winter and spring, it became a political and policy scandal. In April the Prime Minister, Tony Blair, mobilised the UK's central emergency apparatus, the Cabinet Office Briefing Room, and took direct control of the policy response. Many believe that this muscular approach saved the day. Others – we count ourselves among them – do not.

This foot and mouth story isn't new, but we revisit it because we will use it to think about actor network theory (ANT) and how the latter might relate to policy. ANT was developed in the 1980s by Michel Callon, Bruno Latour and John Law in large measure to understand scientific innovation and technological change, though since then it has travelled widely to many other – though not primarily policy – areas. So what is ANT? In 1999, Bruno Latour argued that, despite the name, it does not count as a *theory*.[3] Certainly it is not predictive, and it does not offer social laws. But if it is not a theory, then what is it? One plausible response is that it is a *tool-kit* for thinking about and studying the social;[4] more particularly, that it is a tool-kit for charting *practices of association*. We will return to this in a moment. But we want to argue that it is something else too. Properly handled it is also a *critical sensibility* both *analytically* and *politically*. It becomes a way of energetically undoing otherwise hampering taken-for-granted assumptions: about the *social* and the *natural*; about the *world*; about *politics*; and we will argue here, about *policy*. It is – or it can be – a way of making

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[2] The causes of the disease outbreak and the process of controlling it were the subject of a series of official reports including especially: Foot and Mouth Disease 2001: Lessons to be Learned Inquiry (2002); National Audit Office (2002); Royal Society of Edinburgh (2002); Royal Society (2002). There is also a large social science literature on the outbreak. Representative publications include: Bickerstaff and Simmons (2004); Campbell and Lee (2003); Convery et al. (2005); Convery et al. (2008); Döring and Nerlich (2009); Law (2006); Nerlich (2004); Nerlich (2006); Ward, Donaldson and Lowe (2004); Woods (2004).
[3] Latour (1999).
[4] Law (2008).

waves. To use the phrase of feminist technoscience scholar Donna Haraway, it is potentially a way of *making a difference*.[5]

We owe the term itself, 'actor network theory', to Michel Callon's attempts to understand failed industrial innovations like the French electric vehicle which (he showed) was a mess of people and theories and physics and electrodes and policies that singularly failed to gel.[6] His question was: how should we think about this complexity? What should we call this strange way of tracing relations? Thinking about this question led him to talk about 'la théorie de l'acteur reseau' or 'actor network theory'. Why this term? One answer is that it was an *oxymoron*, a contradiction in terms. How could an actor also be a network? The conventional assumption was that an actor was a location, a point, a place, a site of action. It might be in a network, but it was not a network itself. But that was precisely the point. Callon's term broke down the division, often held to be crucial in sociology, between agency and structure. For this reason it was shocking.

Though many in social science still make the distinction between 'macro' and 'micro', it is no longer obviously strange to say that an actor is also a network. Perhaps, then, we should say that actor network theory has been a successful project. This may be right, but this success has been bought at a price, because there is a case for saying that ANT has been choked by its own success, lost much of its power to shock and become its own intellectual orthodoxy. This, we want to suggest, is bad for actor network theory but also bad for thinking about substantive issues including policy. Is it good enough to *apply* ANT to policy? Is it some kind of formula that can, indeed, be *applied*? Or, is it also *disruptive*? Does it force us to rethink how we frame questions about policy? Here is our prejudice. Social science does not *have* to be critical. It does not have to reframe how we think about the world analytically and politically, but it is at its best when it does this. And that is what we want to explore in the present paper.

We start by reminding ourselves why ANT is, or was, or might be *shocking*; with how it is or was or might be *critical*; with how it does, or did, or might make, a difference. To do this we briefly rehearse its 1980s initial position when it argued first, that the world is *heterogeneous* and second, that it is *relational*. Then we will move forward to the 1990s, which is when ANT started to talk clearly about *ontological multiplicity*. (We will return to this, but for the moment let's just note that ontology is the term philosophers use to talk about what is, in general, in the world). This, we will note, is a continuing controversy. If we say that the world is ontologically multiple – that it is not coherent – then this sits uneasily for many. Then, third, we move forward again to the present day to talk about how the contemporary successor projects to ANT work on *framings*, their *ontological performativity*, and how these *generate possibilities and impossibilities.* Then, and finally, we return directly to the issue of policy. We make the argument that if we imagine the world as ontologically multiple then policy changes in its character. We also argue that if policy makers recognised this then policy would change in its character in interesting and provocative ways. In short, we argue that ANT and its successor projects have the capacity to take us deep into the heart of critical social inquiry with radical implications for thinking politics and policy.

A final word before we start. ANT comes from the discipline of STS – Science Technology and Society. Like all disciplines, STS has its own intellectual habits and practices. In particular, it usually makes its

[5] Haraway (1994)
[6] Callon (1980).

theoretical arguments empirically in the form of case-studies. This is how we will work in the present paper. Our interest is in policy, but we work through materials about foot and mouth disease.

Heterogeneity

Foot and mouth was a *material* horror. Six million animals were slaughtered and then there were six million carcasses. One of the authors of this piece was rather directly involved. Singleton was born and raised on a small farm. Her family still farms beef cattle, and she is still, albeit peripherally, involved in farm work. For her family – and many of the neighbours – foot and mouth was a scourge and a terror. In 2001 large-scale industrial farmers were sometimes quite pragmatic: they thought about the compensation if their animals were slaughtered, and they often shrugged their shoulders: in an economic logic it might not matter very much. But for many if not all of the small farmers it was a terrible plague. If it appeared on the farm or on neighbouring farms it would destroy a herd that had been carefully bred, cared for and nurtured perhaps for generations. It was a grim time. Farms were locked down. Social contact was minimised. People became isolated. Any arrival at the farm might be bringing death. Each day the BBC's *Farming Today* brought more accounts of horror. Every phone call might be the harbinger of destruction. Happily Singleton's family farm escaped the disease.

The other author, Law, was not involved in farming, and did not share the isolation and the grief of the farmers. But one day he drove through the worst-affected part of Britain, the Eden Valley. It was a wet day in late March, cool, humid, gloomy, and with a low cloud ceiling. He was driving fast yet it took the best part of half an hour to pass the pyres of slaughtered carcasses. For miles on end columns of smoke lifted into the soggy sky from the fields and the hillsides and disappeared into the looming overcast. It was like a scene from Dante's *Inferno*. The stench was acrid. It brought tears to the eyes, both literally and metaphorically.

This grim time was *material*. ANT reminds us that we live in a world that is *materially diverse* or materially *heterogeneous*. We don't need foot and mouth to experience this, but its horrors help to drive the point home. Analytically, the argument is that if we want to understand foot and mouth disease – if we want to understand anything – we have to think about how it was practised in all its material forms or, to put it a little more carefully, how the practices worked to generate particular material combinations and forms. We will return to this point and explore it shortly. For the moment we simply need to note that for foot and mouth disease this meant exploring practices that included and helped to shape a whole range of materials including: animals, living and dead; barns and fields; captive bolt guns; slaughter men, vets and farmers; the nightmares of children; railway sleepers and flames; bloated carcasses; notices served on farmers; official paperwork; tissue samples, laboratory tests, epidemiological data-bases and computer simulations; organisational arrangements; phone calls; news releases; ministerial statements in parliament. To understand foot and mouth disease you need to look at its *materials* and explore how these were practised in different sites and locations.

This can be done in ways that have little to do with actor network theory, but as a matter of fact this is what 1980s actor network theory actually taught us to do. The world, it said, *is practised in materially heterogeneous ways*. It added that materiality is a relational effect, a consequence of interaction. This is because materials are not given but are formed in the webs that make up worlds,

more or less durably with their different tactilities or textures: smooth, rough, sweet, noxious, elusive, or obdurate.[7] So this was ANT's first sensibility – material heterogeneity and relational materiality. It was shocking at the time. How was it possible to treat 'humans' and 'non-humans' in the same terms? – though perhaps it is less shocking now. However, it remains disruptive in at least one policy-relevant manner, because if you think in this way it follows that 'nature' cannot be easily distinguished from 'the social'. Instead of being separate domains they are all ravelled up together. 'Society' and 'nature' are being generated – and then perhaps separated – in practices. This means that foot and mouth disease is neither simply 'natural' nor (more obviously) only 'social'. In *practice* policy tends to know this but we are interested in what happens if we make this explicit.

Relationality

ANT has a way of thinking about this that asks us to rethink what it is to be 'social'. Bruno Latour suggests that this is a matter of *association*.[8] The argument is that to be social is to associate and that to study the social is to study association in all its material forms. If you want to understand foot and mouth then you will need to explore its practices and its materials.[9] You will need to go everywhere, into the farms, the barracks, the laboratories, the government committees, and the offices of vets. If you want to think well about policy you will need to go to these places too. You will need to think through how what we more commonsensically distinguish as 'the social' and 'the natural' can be understood and worked on together. A farm becomes a meshwork that combines the two, and it needs to be understood in this way if good policy about how to handle foot and mouth is to be developed.

Think for instance, of Burnside Farm, the place where the 2001 epidemic started. It was a set of associations that caused the virus to multiply. Here is a small subset of those associations.[10]

1. *Non-boiling*. Boiling and viruses do not mix, but it turned out that the farmers did not boil the catering waste they were feeding to their pigs.
2. *Ill-health*. Why didn't the farmers boil the feed as they were supposed to? One answer is that they were stressed. One of them was ill, as it turned out with a terminal condition.
3. *Illegal trade*. How did the virus get to the farm in the first place? The answer is, almost certainly on illegally imported meat which probably came from catering waste.
4. *The absence of vets*. The Burnside farmers knew their pigs were sick, but they didn't call in the vets so most of the pigs got the disease and the virus multiplied a billion-billion-fold.
5. *The time of year*. February was a good month for the virus. It was cool, damp, and there was little sun. The virus survives for longer outside the animal body under such conditions. And we can add in the fact that the prevailing wind blew a plume of virus to sheep on neighbouring farms.
6. *Invisibility in sheep*. When they contract foot and mouth sheep do not usually get very ill. This means that farmers do not see it, or they put any malaise down to something else. Furthermore

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[7] Law and Lien (2013).
[8] Latour (2001).
[9] Latour (1987).
[10] For the original veterinary report see Dring (2001).

the disease usually spreads slowly in sheep. At any given time it is likely that only a few of them will be ill. Overall it is difficult to detect unless it is already suspected.

7. *Market relations*. The network of market relations, the large scale buying and selling of animals, this was important too. There were huge numbers of animals passing through the giant market at Longtown in late February 2001.

8. *The Common Agricultural Policy*. At the time the CAP headage payment system for animals meant that there were incentives to trade sheep in large numbers before the count date – which explains the huge Longtown trade.

More associations can be easily traced, but already the network is heterogeneous. We see economics, personal ill-health, policy, nature, geography, and professional competences all being jumbled together relationally in a specific set of practices – and this is what actor network theory, circa 1986, was teaching us. It was telling us that if we want to understand what is going on and intervene in it effectively then we need to find ways of thinking about and handling that heterogeneity. And then, and as a part of this, we need to understand that ANT does not work with simple social explanations. It does not go looking for class, or state power, or gender, or relations of production, or globalisation or neoliberalism or democratic deficits. It doesn't use these or their equivalents to explain anything – it is not socially reductionist.

Multiplicity

We have argued that ANT treats relations as central to practices and that those relations shape and form the actors caught up in them. To put it a little differently ANT is telling us that realities, what there *is* in the world, are *done in practices*. This means, for instance, that foot and mouth disease took a very particular form on the farm at Burnside: that it was what it was there as a result of the relations enacted on the farm.

There is one way in which this leads us to a commonplace. It is obvious, for instance, that if we think about time then practices change, and so too do social realities. The UK before foot and mouth disease was not the same as the UK during the foot and mouth outbreak. The epidemic was not the same in early March as in early April. Michel Callon talked about how realities change over time in his work on technological innovation, and his approach explores such *ontological variability*.[11] But embedded in the ANT approach, though this was not quite explicit in the 1980s, is the suggestion that if realities are relational in practice, then it follows that there will be *lots* of realities not just over time, but alongside one another at the same time, that there is *ontological multiplicity*, to use the term coined by Annemarie Mol and explored in her book *The Body Multiple* which appeared in 2002.[12]

Think about foot and mouth again. What *is* foot and mouth if we think about it in ANT terms by attending to the relationality of practices? The startling answer is that it is *different things in different practices* because it is being *done* or performed differently in those different practices. The point is difficult conceptually because it is so far removed from Western common sense in which we tend to assume that in general the world is a more or less stable place. Any disagreements we may

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[11] Callon (1991)

[12] Mol (2002a); though see also Mol (1999), Law (2002), Stengers (2005), and for a contemporary expression, Latour (2013).

have about its character we tend to ascribe to differences in our political, social or cultural perspectives. But actor-network theory is leading us in a different direction. It is telling us that it is most unlikely that whatever we are looking at is one thing at all. So, for instance, a 'natural' reality such as foot and mouth disease is not just *seen* differently by vets, virologists and epidemiologists (though indeed it is.) It is *actually* a different thing in veterinary, virological and epidemiological practice. It is made or done to be different in these different practices. *It is a multiple reality*. So how does this work in practice?[13]

Vets go looking for *symptoms*. That is what they did when they first found the disease in 2001 in an abattoir in Essex. Pigs were squealing, which was unusual. It turned out that they were hurting when they walked, so the vets looked at their trotters and found *blisters*. When they looked at the snouts of the pigs and they found more blisters. This is characteristic of veterinary practice. Vets do things in their own particular way with their own particular technologies and their own particular sensibilities. As a part of this, their practices do *diseases* in their own particular way. To put it succinctly, for vets, diseases are conditions indexed by *a set of signs* which for foot and mouth include fever, pain, blisters, lameness and listlessness. These are the kinds of signs that vets look for. The story is Foucauldian – it is a version of his account of the *clinic*. It is about looking for signs on the surface of the body that might index a clinical condition.[14] And the *ontological* move? In the clinic foot and mouth *is a condition within the body, revealed by signs on its surface*. That is what it *is*, nothing more, and nothing less. That is how it is *enacted*. This is foot and mouth number one within the multiplicity.

In the laboratory it is quite different. In 2001 the laboratory gold standard was the ELISA test. ELISA stands for Enzyme-Linked ImmunoSorbent Assay. In practice it is more complicated, but it works along the following lines. Bodies infected by viral antigens make antibodies. If you want to find out whether your animal has foot and mouth disease you take a blood sample. If the animal has the condition, then the blood will contain antibodies (antiserum). These will bind to viral antigens; that is, they will bind to antigens that you have prepared beforehand, foot and mouth antigens. Then you add a colouring agent which will turn yellow if binding has actually taken place. In short, what you do is to look for the colour. This is no longer a world of clinical symptoms. It *is a different set of practices and relations and m*aterials and skills. Foot and mouth here is a virus in a laboratory. So what is a virus here? The answer is that in the ELISA test a virus is something that carries an *antigen*. That is what it *is*. That is what it is made to be, nothing more and nothing less. That is what it is performed to be. So foot and mouth number two is an *antigen-carrying, antibody-provoking sub-microscopic particle*.

In *epidemiology* the disease changes again. It becomes something that moves and gets transmitted through a population. Whether or not it spreads is a function of the *likelihood of transmission* which is itself a function of: the number of carriers; the number of sources of infection; the size of the susceptible population; where it is; how susceptible it is. In epidemiology you feed the numbers in and you can model what is happening. You may also try to predict what will happen. So this is disease number three, and it is different yet again. In epidemiology foot and mouth disease is done as *a traceable condition that spreads from location to location through a susceptible population*.

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[13] In this section of the paper we draw on Law and Mol (2011).

[14] Foucault (1976).

So what should we be making of this multiplicity, and of differences such as these? What should we be making of the fact that foot and mouth is done in different ways in different practices, and thus that it is *made* to be different?

Usually we imagine that there is a real disease. We take it for granted that this real disease is there, so to speak, out there in the world. That's the *reality*. And then we say that in practice we don't necessarily see that reality very clearly. This is because there are different *perspectives* on that reality, that we have different *tools* for studying it, and in any case we have different *concerns* about reality, we are interested in different parts of it. So in the context of foot and mouth disease we say something like this: that the vets and the lab scientists and the epidemiologists are all hard at work trying to understand reality. They are trying to understand aspects of the disease. But then we add that there is a reality underneath or behind those different perspectives. Typically, then, we draw a line between *reality* on the one hand, and what we *know* about it on the other. To put it in the jargon of the philosophers, we draw a division between ontology (what there is) on the one hand, and epistemology (what we know about reality) on the other. But this is precisely what actor network theory does not do, because in ANT *realities are done along with representations*. And then the crucial point: since there are lots of practices there are also *multiple realities*. Practices are sitting alongside one another in different places and practices, and what becomes really important (apart from the practices themselves) is how the different disease realities get related together in practice.

This is an empirical matter. So, for instance, laboratory practices need blood samples, and the samples mostly come from vets who think that they might have a clinical case of foot and mouth on their hands. If the laboratory finds antibodies, then the two practices line up. They make a combined co-ordinated reality, one that is both clinical and viral. But what happens if this does not happen? Then you can start to argue. Did the vets get it wrong, or did something go wrong in the laboratory? (Both happened often enough in 2001). And then you can extend the logic to take in epidemiology. Its raw material, the figures for animals infected, where do these come from? In theory they come from lab-confirmed clinical diagnoses, but what about practice? Often this is what actually happened but not always. For instance, sometimes the labs got overwhelmed. Then it was the veterinary realities that counted in the epidemiology and the laboratory reality fell out of step.

So that is ontological multiplicity, and it is very difficult to think because, as we already observed, it flies so directly in the face of everything that we assume about the world in most forms of Western common sense. Our common sense usually tells us that there is a world, a world with a definite structure out there. It tells us that except around the margins the general structure of the world, its form and shape and its principles are little affected by human activities. It tells us that the world is pretty independent of human volition, at least in general, that it predates our attempts to know it, and perhaps most obviously, that there is only one of it. We live, in short, in a single world and we are all, as it were, inside it. But in this actor-network way of thinking – in the actor network attention to the relationality of heterogeneous practice – all of this is thrown into doubt.[15]

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[15] This is explored in Law (2004). For recent further discussion see Law and Lien (2013).

Framing

So what might this mean in the context of policy? To start with the obvious, like technologies, policies change. So here is what happened in 2001.[16]

1. Policy number one: national animal movements were stopped. Animals on infected premises were slaughtered, and animals on adjacent farms were put under surveillance. This happened on February 23rd.
2. Policy number two: culling was stepped up. In the worst affected area in Cumbria sheep within three kilometres of infected premises sheep – not other farm animals – were to be slaughtered. This was because the Ministry's epidemiological model (we will call this the 'Ministry Model') said there was a slowly growing epidemic but only among sheep. This happened on March 15th.
3. Policy number three: two weeks later on 27th March cull levels were ratcheted up again. All animals on farms next to an infected farm were to be slaughtered – on the so-called 'contiguous premises'. There were several reasons for this. Political pressure was important: the headline figures were growing and there was intense media interest and concern. It was also, however, because a rival set of epidemiologists had made different and more pessimistic predictions (we will call this the 'Imperial Model' because it was being run at Imperial College, London), and those rival epidemiologists had a direct line to Prime Minister Tony Blair.
4. Policy number four. The figures for infection started to fall. And so did the political pressure. A month on, rare breeds were excluded from the contiguous cull together with hefted sheep, and cattle too, with appropriate biosecurity.

So policy changed as it adapted to changing realities. This is obvious. Neither is it anything other than obvious that there are large literatures on policy success, policy failure, and policy change. Commentators and policy makers talk, for instance, of failure to implement policy, of implementation gaps. They talk about gaps between policy on the one hand, and reality on the other: sometimes these are taken to be unbridgeable and this explains policy failure. Sometimes it is claimed that policy has failed because its formulation and implementation has been too slow. Or policy failure can be similarly attributed to an insufficiently supple approach to policy making in which policy then gets fixed in ways that do not work.[17] All of these failures were pinned on the UK

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[16] In the present account we have omitted significant details. For a more careful account of the culling policy and its epidemiological correlates with references to the primary literature see Law and Moser (2012).

[17] The British Gov.uk website states that "A policy is a statement of what the Government is trying to achieve and why." (accessed 6 August 2013) Government policy is described as a process of turning statements about aims into measurable outcomes or indicators. However, Hill (2005) in *The Public Policy Process* argues that what policy is, is notoriously difficult to define. More often work has focused on questions about implementation and behaviour change. Early work about implementation was concerned with the 'missing link' between policy making and policy outcomes (Hargrove: 1985). Subsequent work explored the implementation gap between policy aspirations and reality Pressman and Wildavsky (1984). More recent work considers implementation as an interactive and negotiated process requiring flexible, adaptive strategies (Matland: 1995). Nevertheless Gill (2013) in her detailed study of waste management argues that the basic ontology underpinning many of the studies of implementation remains the same – policy and its implementation are in separate realms. Policy is an object to be implemented even if through a process of negotiation and adaption. In the current paper we are primarily concerned with studies of policy that are informed by Science and Technology Studies. Through case studies in various substantive locations these studies have explored how policies and legislation work and are enacted into being. The studies are critical of the concept of policy as an object to be implemented, demonstrating rather that policy is a set of practices that is done variably in multiple locations. (For example, in waste management see Gill (2013); in health care

policy response to the foot and mouth epidemic, and no doubt they are all to be taken seriously. But the actor network point that we want to explore is different and has to do with multiplicity. The argument comes in two forms. First, it says that policy usually assumes that there is a *single reality* (which changes over time). Second it assumes that it is possible and appropriate to create a *single policy*. Policy works, in other words, on the assumption of ontological singularity. But then we need to add a further disruptive thought. This is that it *also* works, albeit tacitly, by assuming that there is more than one reality and more than one policy. To put it differently, policy practices enact a single world and a single policy, but they also enact multiple worlds and multiple policies.

The singular part of the argument is similar to what we have said about the vets, the laboratory scientists and the epidemiologists. Policy assumes that there's a *single* disease, foot and mouth, even if it manifests itself in different ways, clinically, in terms of immune reactions, and epidemiological transmission. It rests on the assumption that there is a single framing reality and then it helps to enact this by assuming that if there are differences between practices then these reflect different perspectives – or mistakes. But in the case of foot and mouth there is a very interesting complexity here to do with epidemiology. A few moments ago we said that there were two teams with different models.[18] The history tells us that model number one, the 'Ministry Model', defined epidemiological reality until March 27th. After that, model number two, the 'Imperial Model' created by epidemiologists with links to the Prime Minister's cabinet office, took over and the culling was ratcheted up. So what should we make of this step change?

The obvious explanations come in two forms. One says that in late March it became clear that the Ministry Model was wrong, so it was time to change models and policies. The second is to say that the Ministry Model was actually right all along, and that it was just about to produce results. Unfortunately, this second explanation continues, Prime Minister Blair was unable to resist both public and insider political pressure, so he quite unnecessarily backed the Imperial Model instead.

All of this was fiercely controversial in the corridors of power: it was a real dispute both scientifically and politically. But from the point of view of actor network theory it looks rather different. To do this, think about the realities being done. Here's the crucial move. Despite the disagreement the two sides both took it for granted that there was a single reality out there. What they were doing, instead, was to argue about whose approach modelled it better. Indeed, the controversy *depended* on the framing assumption that there was a single reality out there to be studied, modelled, and worked upon. To put it more strongly, *even as they debated the epidemiologists were also enacting a single framing reality*.

So that is the singularity part of the argument. And the multiplicity? The answer is profoundly counter-intuitive. It is that in practice *reality itself changed on March 27th*. On March 26th reality was one thing for policy-makers. It was a slow epidemic amongst sheep. On March 28th it was different. It had become a disease that was sweeping everything before it. The argument is that reality in practice changed on March 27th for the government machine – and given the power of the

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see Timmermans and Berg (1997), Berg and Mol (1998), Pols (2012); in agriculture see Hinchliffe (2001); (Singleton: 2012)) It is in their 'doing' that things – a disease, a policy – are enacted into being. Nevertheless researchers have struggled to find effective ways of articulating that 'policy' is not singular but multiple, that it is 'more than one but less than many' (Mol: 2002b). This is the focus of the current paper.

[18] In practice it was more complicated, but the details are not important here. For details see Kao (2002).

government machine for many others and their practices too. At that point reality became different in practice.

This is difficult to understand and it difficult to think. We noted the reason for this earlier. It is that ANT is starting to cut across some of the most basic framing commonplaces of Western metaphysics. In particular it is eroding the assumptions that reality is outside, prior, structured and pretty independent of whatever it is that we do. But what do we learn if we stick to our ANT guns from the point of view of policy? How do things get reframed? We want to suggest an answer in two parts. First, it makes it possible to argue that reality is not destiny. And second, if points us in the direction of a much more fluid version of policy in which nature and the social are negotiated and handled together.

Reality is not destiny

First a precautionary note. There is no way that we can invent realities. That is a fantasy, and despite occasional misunderstandings, ANT has never said that. So, for instance, it has never talked about the 'social construction of reality' because realities are practised into being in heterogeneous networks of relations which takes a lot of effort, many resources, and a great deal of hard work. The task of enacting or practising reality – or truths about reality – is not trivial. Just ask the people doing the ELISA test. This was not something that they dreamt up on the back of an envelope the night before. To catch the argument in a nutshell, we might say that ANT is very sensitive to the difference between the real Napoleon on the one hand, and those poor souls who proclaim themselves to be Napoleon on the other, and end up being treated for psychiatric disorder. The one was real because he was generally 'practised' as being Napoleon by millions of other people. The others were not, precisely because they were not so enacted.[19]

But having said this, as we have argued above, in this ANT way of thinking realities are done in different ways in different practices. So what do we make of these differences? The answer is both political and material. What happens is the differences between realities makes it possible to ask questions *about realities*, and about which might be preferable if there were several on offer. These are questions that have to do with what we might think of as ontological politics or cosmopolitics.[20] To see how this might work we will create a scenario and ask what might have happened if an actor network person had been Prime Minister rather than Tony Blair. Here, then, is our imagined Prime Minister speaking.

'Look, we've got a choice. We've got two epidemiological realities here.

MINISTRY MODEL	IMPERIAL MODEL
Slow and solid	Clever, fast, and not so solid?
MINISTRY REALITY	IMPERIAL REALITY
A slow-moving epidemic in sheep	Epidemic spreading dramatically
MINISTRY PREDUCTION	IMPERIAL PREDICTION
Number of cases will peak shortly	Number of cases will grow
MINISTRY POLICY	IMPERIAL POLICY

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[19] This argument is made more carefully in Law (2009).
[20] Mol (1999); Stengers (2010).

Hang in there!	Contiguous cull

What are we going to make of this?

The first thing we need to ask is: is either of them flaky? Should we just be abandoning one of them?

Well, the answer is no. We shouldn't be abandoning either. They haven't been constructed out of nothing. They are both the product of quite serious work. So they are both quite solid. But they are only *quite* solid, because the Imperial Model is a (how to put this?) a little on the 'experimental' side. It has come from statistical microphysics and it is very, very, clever. Almost no one understands it, and it's a bit quick and dirty, which is both good and bad. Quick is good, because speed is also important. We need to react rapidly. We can't just sit on hour hands as the situation changes. But dirty is less good. So, for instance, it doesn't 'know' where the infected farms actually are (it does this by being 'clever' instead, statistically). And it cannot tell the sheep from the goats – or to be more precise, from the cows and the pigs – because all its animals are (as they put it) 'generic'.

So that's the Imperial Model. And the Ministry Model? The model made by the men from the ministry? This is thorough, slow, it 'knows' a lot (and a lot about sheep), and it has been road-tested in other epidemics. So as Prime Minister my first conclusion is that we need to take both these realities seriously. Neither of them are off the wall. We can't afford to dismiss them. We're not dealing with demented dreams here.

Second question?

We also need to think about other relations. We need to be thinking about the social as well as nature. For instance, we need to be attending to what the voters and the media are saying. They think that our policy – wait and see in most places, and cull sheep within 3 km of places with the disease – isn't working. That is an argument for giving up on the Ministry Model. Indeed, that is what Tony Blair thinks we should do – and the Imperial Model people too. But the Ministry Model people don't agree. They say that the policy is working, but that it is slow because infections take a while to appear. In other words, if the figures are increasing it is because the sheep that have now been diagnosed with foot and mouth were mostly contracting the disease before the Ministry policy was implemented. This is why they are saying that any day now the figures will start to fall. They are saying in short that we just need to hang in there.

And here's something else. The Imperial Model will take us to a national contiguous cull for all animals. The press is unhappy with us now, but that is going to be really grim. We're going to be slaughtering millions of animals. Millions and millions will lose their lives prematurely, and perhaps unnecessarily. And will be upsetting all sorts of people including farmers, specialist breeders, vets and many members of the public. So we need to think about that too.

Okay. So what do we decide?

> Here's my decision.
>
> *The Ministry Model's reality is better if it works*. I've just explained why. It's socially better. And here is the rub, it might be working epidemiologically. So I am going to give the Ministry Model one last chance. We are going to meet again in ten days' time. If the figures are not falling by then, we will jump ship and jump realities. We will put the social and the Ministry Model on one side. We will go for – we will enact – a hard epidemiological reality, and to hell with the social consequences.

That is our first scenario, and to judge it we now come back to the reality – or the succession of realities – that actually unfolded. Here it turns out that the statistics are really important. This is because these found that *the numbers indeed started to fall* in the ten-day period we have just mentioned. The lesson is that in this actor-network world, they never moved to the reality enacted by the Imperial model at all. *They did not follow Tony Blair*.

The lesson we want to draw from this is that actor network theory helps us to see that realities – including hard science realities – do not define destiny. Yes, we certainly need to take them seriously. They are real enough. But no, they do not necessarily tell us what to do. If we are willing to think this way in some measure it becomes possible to open up alternative possibilities and alternative realities. It becomes possible, too, to think about how different goods and bads are tied up with different more or less plausible realities.

Realities are Multiple

Lesson number two is also about multiplicity and to explore it we outline a second scenario. This is a little later in the 2001 epidemic, and it assumes (as indeed was the case) that the contiguous cull took place, so we are now deep in its horrors. Again we give the word to our imagined Prime Minister.

> 'Okay everyone. Here's my prejudice. Realities are multiple. And we need to take that multiplicity seriously. So here's the first thing I want to say. *We've actually got multiple policies at work* in all sorts of more but also less obvious ways.'
>
> At which point a civil servant says: 'sorry, prime minister, but can you explain what you mean?'
>
> 'Okay, you all know about the contiguous cull. We're slaughtering all the animals on farms next to those that are infected. This sounds nasty but simple, but actually it isn't simple at all. Why not? Because, here's the answer, they are doing it differently in Scotland. The Scots aren't actually killing the animals on contiguous premises. They're culling animals on farms round the edge of the *whole* infected area. Why? Because their priority is to stop the infection spreading from the south of Scotland to cattle further north. So, here's the first conclusion. It isn't one policy we're dealing with here. It's two.
>
> 'Your point, Prime Minister?'

'Let me continue, because it's about to get more complicated still. Here's policy number three. We're killing every animal in parts of the island of Anglesey because the infection there is so serious.

'And then we've got policy number four, except that it isn't a *policy*, not officially. It's just grown up like topsy. Because in practice the contiguous cull isn't actually happening in a lot of places at all. It's not being (as they put it) 'fully implemented'. Lots of animals are escaping. One, because we're short of slaughter men and vets. Two, we're up against legal challenges. Three, we know that animals due for culling are sometimes going missing. 'Animals' say the small-holders. 'What animals? There's no animals around here.' And then there's active resistance too. Just occasionally shotguns are appearing at farm gates when the vets drive up. So they go away again and never come back. (Who can blame them?) So that's policy number four. And five and six and seven. Except that these aren't policies. Not officially.'

At which point a civil servant intervenes. 'So what's your point, Prime Minister? We appreciate that implementing policy is always difficult. That's it's always done imperfectly.'

'I've got three points,' she says.

'One. We're dealing with *policies multiple*. And not just in Scotland and Anglesey. And I think it would make sense to recognise this, instead of getting cross and bleating on about 'implementation gaps' or the like. Here's the point. *In an actor network world policies will always be multiple and we'll say so*.'

'Yes, Prime Minister,' says the civil servant. 'So you'd like us to be more tolerant?'

'That would help,' she continues. 'But I'm not through yet. Because what I'm really saying is that the different policies are reflections and enactments of different realities. Or, to turn that round, I'm saying that different realities are being done. In different policies.'

'I'm sorry', says the civil servant, and he's beginning to sound a little anxious, 'but now you have lost me Prime Minister'.

'That's because you don't really get ontological multiplicity.' She says. 'Here's the pitch. Policies in practice do different things. They render the world in different ways. With the help of shotguns. Or law courts. Or a range of mountains between two farms. Or barns for hiding animals in. But, here's the point, *realities* are being done in these practices. And those realities are all different. In practice even a single policy enacts different realities along with vets, shepherds, barns, shotguns and all the rest. If we think we're dealing with a single reality when we try to implement a policy, then we're simply deluding ourselves.'

By now the civil servant is looking alarmed, but he's a born diplomat so he simply says:

'Perhaps, Prime Minister, you could explain what this might mean in practice?'

'I'm glad you asked me', says the ANT Prime Minister. 'Because if realities are different, we need to think very hard before we instruct people what to do. I'm not saying we should never do that. But do I think there's a good case for saying: look, none of us actually want

> our animals to catch foot and mouth. So here are some *policy suggestions*, think of the as a kind of checklist. We've thought about them, so we'd like to ask you to take them seriously. But if things are different for you, if your practical realities are different, then we're happy to talk with you, though preferably without the assistance of a shotgun. We're happy to discuss alternatives. We're happy to try them out. In short, we are happy to trust you, at least for a time, and then to see what happens. We'll have *policies multiple*, officially that is, as well as realities multiple.'

By now, the civil servant has his head in his hands but we will ignore him because (this is our second policy-relevant point) actor-network theory reframes how we think about the world and about policy because it helps us to see that realities are multiple, and multiply realised, in policy and everywhere else. It acknowledges this. Then it tries to find ways of working on and in this multiplicity. And finally it asks how those realities might overlap with one another in ways that are not too destructive, selfish, or colonising in practice.

To End

This is a message that does not just come from actor-network theory. Philosopher Isabelle Stengers has talked about the need for a *Cosmopolitics* that works on and extends the character of the real.[21] Michel Callon and his collaborators have debated about how to act in a *common world* that is also ontologically multiple.[22] Bruno Latour has asked for a *non-modern constitution*, and characterised ontological multiplicity by talking a different *modes of existence*.[23] Donna Haraway has talked about the *interferences* that go along with material-semiotic struggles.[24] Annemarie Mol has talked of *multiplicity* and *ontological politics*.[25] Marisol de la Cadena, Mario Blaser and Arturo Escobar are struggling with the implications of a *pluriverse* in the context of post-colonial encounters.[26] Helen Veran has talked about how different knowledge traditions – and realities – might *go on together*.[27] That's the shared agenda that struggles with the message that after the heterogeneity and the relationality that: (1) there is no such thing as a single reality; (2) that realities cannot simply be dreamed up but take work and care (climate change deniers please note); and (3) that realities and politics or normativities are all wrapped up together. For this is a world in which reality is no longer destiny, even though it never was.

But what to make of this in the context of policy? How, to use Verran's felicitous phrase, might we go on together – and go on together well? It is tempting to imagine that rules might help and this cannot be entirely wrong. As our fictional Prime Minister said, 'never say never'. But in the scenarios we have played out above we have moved in a different direction. Policy, we have suggested, might be better conceived of as a list of questions or issues, of considerations that might be relevant to the policy, or the policy concerns. Perhaps this is a rule: 'let's create a list of questions, agree that we discuss how to handle the concerns on that list, and the possible actions that might meet those

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[21] Stengers (2005; 2010). But see also Hinchliffe *et al*. (2005).
[22] Callon, Lascoumes, and Barthe (2009).
[23] Latour (2004; 2013).
[24] Haraway (1991; 2008).
[25] Mol (2002a; 2008).
[26] Escobar (2008), de la Cadena (2010); Blaser (2010).
[27] Verran (1998; 2001).

concerns.' But if it is a rule, then it is a rule in the mildest possible form.[28] It is a rule that reflects and respects the fact that the world is irreducibly multiple and irreducibly distributed between different practices across time and space. It is a rule that recognises that forms of knowledge – including policies – and realities – are irretrievably situated. Of course if you are interested in policy you might prefer to draw it all together. But despite our stories about an actor-network Prime Minister we have tried to show that this is not an aspiration that makes sense in anything other than a local way. This is why we have stuck with foot and mouth disease and 2001 and created only the mildest possible rule rather than talking about policy in general. There is no policy in general.

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[28] Nudge Theory is currently very popular with policy makers in the UK and elsewhere. It draws heavily on insights from behavioural economics to argue that by presenting choice better through manipulating choice architectures people make wiser choices (Thaler and Sunstein (2008). The British Government became the first in the world to set up a behavioural insight team drawing heavily on nudge theory in 2010. Critics argue that nudge practice is coercion by other means whereas Thaler and Sunstein argue that it is in the spirit of libertarian paternalism. The jury is out on the effectiveness of nudge in relation to policy recommendations yet it remains an influential approach to government policy development in the UK. Whilst our list might be read as creating choice architectures, it is precisely not trying to promote a specific behaviour change as it does not assume a single, correct response. The current paper argues for policy as located in practices and hence as co-evolving with behaviour change and as situated, negotiated and multiple.

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