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Avian influenza multiple: Enacting realities and dealing with policies in South Africa's farmed ostrich sector☆

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A B S T R A C T

This paper draws on Annemarie Mol's empirical philosophy as a way of handling the science of avian influenza in South Africa's ostrich industry. This is an agricultural industry in rural South Africa that has recently suffered severely from infections of highly pathogenic avian influenza. The paper draws on the 'materials and methods' section of scientific papers, and interviews with scientists, veterinarians and ostrich farmers, to argue that the practices associated with the disease enact multiple avian influenzas. The paper describes these different avian influenza realities and how they relate. Finally, I examine the relationship between multiplicity and policy.

It is possible to refrain from understanding objects as the central points of focus of different people's perspectives. It is possible to understand them instead as things manipulated in practices (Mol, 2002, 4).

1. Introduction

In June 2004 South Africa's commercial ostrich industry confirmed its first outbreak of highly pathogenic avian influenza. Although low pathogenic strains had affected free-range farmed ostriches in the past (Allwright et al., 1993; Pfitzer et al., 2000; Verwoerd, 2000), this was the industry's first experience with the more virulent strain of the virus. Exports of ostrich meat, feathers and skin were stopped in line with international regulations (Nduru, 2004). South Africa's Department of Agriculture responded decisively to the outbreak. Over a period of 18 months, almost 30,000 ostriches were destroyed to stamp out the disease (Mather and Marshall, 2011). Exports resumed a year and a half later once animal health officials were able to demonstrate that the disease had been eradicated.

An important outcome of the outbreak has been a new and urgent scientific effort to understand avian influenza in free-range farmed ostriches. The results have been impressive. South African scientists and veterinarians have published many papers in leading virology and poultry disease journals (e.g. Abolnik et al., 2006, 2009, 2010; Akol et al., 2006; Cumming et al., 2011; Olivier, 2006; Sinclair et al., 2006b). There are several different strands to this research effort. One draws on laboratory analysis of the H5N2 virus that infected ostriches in the 2004 outbreak (Abolnik, 2007a; Abolnik et al., 2007, 2009). The results of this research have led to a standardised 'typing' of the virus, which has in turn provided researchers with the information required to compare and contrast it with other viruses held in global databases. It has allowed scientists to gain insights into how the H5N2 virus found in South Africa is related to other avian influenza viruses circulating in the northern hemisphere (Abolnik et al., 2007). This knowledge has in turn provided the basis on which to develop tentative theories on the origins of avian influenza outbreaks in ostriches (Abolnik et al., 2006). A second research focus has explored the regional transmission routes of the virus through wild bird sampling (Cumming, 2010; Cumming et al., 2011; Caron et al., 2010). The goal of this research is to assess which birds carry the virus and to determine whether there is a seasonal pattern of infection associated with annual bird migration patterns. These data are then linked to ecological spatial information to provide risk maps, which can provide the basis for an early warning system to alert farmers and agriculture officials of possible outbreaks (Cumming et al., 2008). There is a third body of thinking on avian influenza and ostriches and although some of it is published (Allwright et al., 1993; Allwright, 1996; Olivier, 2006; Olivier and Ganzevoort, 2005; Tully and Shane, 1996), it is also based on farmers' experiences of the

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disease. This science is a more uncomfortable one for agriculture officials to deal with because it suggests that avian influenza in ostriches is complicated, far more complicated than it is in farmed chickens (Olivier, 2006). It is based on field experience and autopsies of ostriches that have either succumbed to the disease or have been culled because they were infected. It suggests, controversially, that ostriches may have some immunity to highly pathogenic avian influenza (cf. Manvell et al., 1996, 1998; Capua et al., 2000; Clavijo et al., 2001, 2003). Not surprisingly, it has raised questions about whether the decision to cull 30,000 ostriches was too harsh a response to the outbreak in South Africa.

How do we deal with these different knowledges about avian influenza in ostriches? The obvious response is that these are different perspectives on one thing, avian influenza in farmed ostriches. The view from the farm, the laboratory and the region provide different ways of understanding the virus and its impact on ostriches. They provide different but complimentary ways of seeing a single thing, avian influenza. Yet there is another way of handling these different knowledges of avian influenza in ostriches. If we follow Annemarie Mol's (2002) inspiration and we 'unbracket' the practices associated with avian influenza in ostriches we see not one but several avian influenzas. Unbracketing involves attending closely to the practices and the materials that establish what we know about objects like avian influenza. Since the practices and the materials differ, what we know about things multiplies. To make this concrete, what appears initially to be different perspectives on avian influenza now becomes *multiple enactments* of the disease. There is not one avian influenza in ostriches. There are several.

Mol's approach is 'praxiography', or the study of practices, a method she uses to analyse atherosclerosis in a Dutch hospital. The injunction is to focus on the materials and the methods that make things real, that allow us to say *this is atherosclerosis* or *this is avian influenza.* It means that we "stubbornly take notice of the techniques [and technologies] that make things visible, audible, tangible, knowable" (Mol, 2002, 33). Yet Mol's intervention is more than method. Attending to the practices that allow us to make objects knowable is not a new approach to understanding 'reality out there'. It is not, in other words, a new ethnographic method for gaining knowledge of the world. It is instead an ontological proposition. Praxiography is usefully defined as an *empirical philosophy*, which breaks with perspectivalist understandings of the world. It runs against the dominant view that there is a single world out there that can be understood in different ways. In contrast to a perspectival approach, where objects exist independently of our efforts to understand them, in Mol's (2002, 5) empirical philosophy "objects come into being and disappear with the practices in which they are manipulated".

Mol's empirical philosophy destabilises the relations between our knowledge practices and the objects we are analysing. She is shifting the register from epistemology to ontology. Our analyses are no longer separate from the worlds we describe. We too *enact* the world through our writing and research outputs. In this way, we are not so different from the natural scientists or medical practitioners that are sometimes the object of our analyses. Doing praxiography is thus an intervention in the world, rather than a description of it.

There is no formula for doing what Mol calls praxiography. Nonetheless, it is possible to identify several stages in what we might call a 'praxiographic analysis'. The first stage involves unbracketing the different practices and material associated with the enactment of the object to reveal its multiplicity. We are asking the question: what *is* this object? In our specific case we are asking: what is avian influenza in ostriches enacted through materials and practices? What are the different 'reals' that are enacted by attending to practices? What are the materials and methods that allow us to say, at this site, this *is* avian influenza. There are several different ways of attending to these practices. In her book *The Body Multiple* Annemarie Mol relies mainly on interviews with medical practitioners, laboratory scientists and other medical specialists involved in treating atherosclerosis. But she also notes that the 'materials and methods' section of scientific papers is an "equally interesting resource for praxiography" (Mol, 2002, 158; also see Attenborough, 2010). This is where scientists write in detail about the materials, techniques and technologies that allow them to speak about the objects they are manipulating.

A second step in doing praxiography involves attending to a paradox: how is it that objects like avian influenza and atherosclerosis are both a single thing, but also multiple? How do they hold together? For Mol, this is a 'remarkable achievement' and deserves our close attention. We want to know how it is that the different objects are coordinated, how clashes between them are avoided and we are asking how it is that the "various versions of an object sometimes depend on one another?" (Mol, 2002, 6).

The shift from epistemology to ontology is not always an easy one to handle. We are no longer describing worlds out there; we are instead enacting them, using the materials and methods at our disposal. We no longer evaluate the strength of our research in terms of whether it captures a greater or lesser extent to the world 'out there'. We are instead interested in attending to the relevant strengths of these worlds, their drawbacks and their limitations (Law and Mol, 2010, 2). We are asking the question, are these worlds being done well? This is the last step of praxiography, although it is somewhat misleading to call it a final stage. For the praxiographer there is no complete and detached academic analysis, which can then form the basis for policy development. Our interventions are instead already and always interfering.

This paper hopes to contribute to a growing body of social science work on animal health and disease through a praxiographic analysis. Social science work on animal health has focused mainly on the experience of the United Kingdom, and for good reasons. Since the late 1990s the UK's livestock industry has been severely affected by disease outbreaks including BSE, foot and mouth disease, and most recently, bovine tuberculosis (Donaldson and Wood, 2004; Law, 2006; Donaldson, 2008; Enticott, 2008a; Law and Mol, 2008). Controlling and preventing disease outbreaks in the UK and elsewhere relies mainly on biosecurity, a set of practices that involve separating diseased from infected animals and things through movement control and quarantine (Hinchliffe et al., 2008). The impact of biosecurity has been explored at various scales – from the relationship between farmers and animal health experts through to the interaction between trade liberalisation and biosecurity (Enticott, 2008b; Higgins and Dibden, 2011; Maye et al., 2012). More recently, the attention has shifted to the relationship between biosecurity and food security (Ilbery, 2012). Biosecurity, as a set of complex practices and policies, as Enticott and Franklin (2009) have suggested, can have far reaching impacts on rural areas. Drawing on their work on bovine tuberculosis, they argue that "biosecurity policies have the potential to fundamentally reorder the arrangement of subjects and objects across rural space" (Enticott and Franklin, 2009, 389).

The specific contribution that this paper makes is to bring the work of Mol and others working in the field of science and technology studies (STS) to animal health and disease. In doing this, the paper responds to a call made by Hinchliffe and Bingham (2008) several years ago. In their work on the biopolitics of biosecurity they drew attention to the possibilities and potential of engaging with STS work, and in particular the work of Annemarie Mol and John Law. The question that STS urges us to ask in relation to biosecurity and livestock disease is: 'how do we know this disease'? (cf. Law and Mol, 2010). In posing this question, we are forced to