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The mosquito's umwelt, or one monster's standpoint ontology

Ian G.R. Shaw [a,*], John Paul Jones III [b], Melinda K. Butterworth [b]

[a] School of Geographical and Earth Sciences, The University of Glasgow, United Kingdom
[b] School of Geography and Development, The University of Arizona, United States

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ABSTRACT

Mosquitoes are able to vector malaria and other diseases across the planet, leading to hundreds of thousands of deaths each year. Not only is this a challenging management problem, we also find it to be underlined by an important philosophical problem, namely: the impossibility of controlling "life". Influential Estonian biologist Jakob von Uexküll wrote that every creature on Earth, from sea urchins to spiders, lives within a unique sphere of existence called an "umwelt", or "surrounding world". The umwelt defines the specificity of relations shared between an organism and its environment. Using this concept we complement existing work on monstrous natures in geography by arguing that "monstrosity" arises in the excesses and discontinuities between the mosquito's umwelt and the human efforts that seek to eliminate it. This finding arises from fieldwork undertaken with public health and vector control officials in the US state of Arizona over several years. Their focus on reducing mosquito breeding sites suggests the complex and emergent spatialities of the monstrous.

1. Introduction

Jacob Johann von Uexküll was born in Estonia in 1864 and spent his life as a biologist writing about animals. His contention was simple but no less radical: there is no clear "divide" between organisms and their environments, and to separate these two spheres is to miss their relationality. Instead, each organism is defined by its particular "umwelt" – its "surrounding world". Such a conviction was the antipode of prevailing (Darwinian) scientific worldviews, which, for Uexküll, reduced animals to robotic reflexes shorn from the habitats they dwelt within: "Whoever wants to hold on to the conviction that all living things are only machines should abandon all hope of glimpsing their environments" (Uexküll, 2010, p. 41). Uexküll's analysis pivots on the role that ecological "signs" play in the lifeworld of an organism. The stand-out example is the tick, the blood-sucking arachnid that patiently waits atop a blade of grass for a passing animal. It only responds to three signs: the odor of butyric acid (given off by mammals), the temperature of 37 °C (corresponding to the blood of mammals), and the feel of exposed flesh. Uexküll thus fused biology with semiotics—leaving a legacy that would impress itself on philosophers ranging from Heidegger and Merleau-Ponty to Deleuze and Guattari. For anthropologist Tim Ingold (2000, p. 4, emphasis in original), the idea that organisms and environment interpenetrate each other was a profound realization: "if *every organism is not so much a discrete entity* as a node in a field of relationships, then we have to think in a new way about not only the interdependence of organisms and their environments but also about their evolution".

Such an appreciation of the umwelt is nowhere more important than with the mosquito, whose micro-breeding spaces continually defy human control and eradication. From their Jurassic beginnings some 100 million years ago to their stubborn persistence today, mosquitoes are a permanent feature on the planet. And for the insect itself—of which there are some 3500 species worldwide today—the human being has proven ideal prey: an easily penetrable blood source that is vital for its continued reproduction. This intimate coupling, which has claimed millions of lives historically, continues to be a fatal attraction. As a vector for the malarial parasite, the *Anopholes* genus is responsible for claiming around one million lives a year, while causing serious illness in a further 250–500 million people—90% of whom live in sub-Saharan Africa. Additionally, one in three people in the world live in a dengue active region, a disease carried by the *Aedes* mosquito that causes illness in 100 million people each year (Center for Disease Control, 2010a). Other potentially deadly diseases mosquitoes vector include *arboviral encephalitides*, such as St. Louis, West Nile, La Crosse, Eastern Equine, Western Equine, and Japanese encephalitis, most of which are spread by *Culex* mosquitoes (Center for Disease Control, 2010b).

Efforts to control mosquitoes have persisted throughout human history, even before humans knew they vectored diseases (Spielman and D'Antonio, 2001). But once that fact was definitively proven in the late 19th century, public health officials, military

* Corresponding author.
E-mail addresses: ian.shaw.2@glasgow.ac.uk (I.G.R. Shaw), jpjones@email.arizona.edu (J.P. Jones III), mkbutter@email.arizona.edu (M.K. Butterworth).

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leaders, and politicians embarked on a worldwide strategy to eliminate mosquitoes, which had transitioned, by the early 20th century, from mere nuisances to deadly enemies. In the early 1960s, over a hundred countries participated in the World Health Organization's (WHO) "The World United Against Malaria" campaign, a global program designed to eradicate malaria and raise public awareness. As part of this strategy, special postage stamps were issued, using mosquitoes as visual themes. Johnston and Fritz (1963) examined these different stamps and found that the WHO's campaign was often represented in warlike terms as a clash between humanity and mosquitoes (see Fig. 1). Such apocalyptic metaphors were not only mobilized in various nationalist projects (Caprotti, 2006; Carter, 2007, 2008), they were also mirrored in political and scientific debates over mosquito control (e.g., should martial law be invoked to achieve "species sanitation"?). Even today discussions continue to center on whether larval (i.e. habitat reduction) or adult (i.e. death by chemicals) control is most effective (Luck et al., 1977; Shaw et al., 2010). The near future points toward genetic engineering as an additional solution, with entomologists at the University of Arizona recently declaring that they have successfully engineered the world's first "malaria-proof" mosquito (Stotle, 2010). Similarly in the UK, a British company called Oxitec is developing "sterile males" for release. These genetically engineered bugs follow a long-lineage of animals spliced and diced with different DNA concoctions (Dixon, 2008; Davies, 2003, 2013; Thompson, 2005).

Small wonder, then, that mosquitoes are often referred to as "little monsters". Such a label is of course evocative of fictional figures, from werewolves roaming in forests to many-headed hydras plaguing Greek legends. Indeed, geographers have recently directed attention toward understanding precisely how the boundaries between "fictional" and "real" monsters are established and maintained by scientific practices and knowledges (e.g., Davies, 2003; Dixon, 2008). In the course of doing so, they have found useful both poststructuralist and psychoanalytic approaches, in which monsters are theorized as posing *epistemological* threats to discursive and symbolic orderings as they go about disrupting the fields of subjective reality (Derrida, 1988, 1997; Foucault, 2003a; Žižek, 1999; 2006a,b). In Foucault's words, "...the monster is the transgression of natural limits, the transgression of classifications, of the table, and of the law as table: this is actually what is involved in monstrosity" (Foucault, 2003b, p. 63).

Our engagement with the mosquito thus adds to an established literature on monstrosity that seeks to destabilize some of the central and enduring pillars of Western philosophy: the superiority of transcendence and Cartesian dualism, the ordering of things, and the insistence on discrete elements (Derrida, 1988, 1997; Foucault, 2003a; Deleuze and Guattari, 2004; Haraway, 1991, 1992, 2008; Latour, 1993; Whatmore, 2002, 2006). It also contributes to the list of nonhuman (and often hybrid) nature 'objects' that geographers and others investigate, from cockroaches (Biehler, 2009), dogs (Haraway, 2008) and elephants (Lorimer, 2010) to lawns (Robbins, 2007). In this sense, we do not stray too far from Latour's (2005) observation that object-oriented analyses are not new. To be sure, geographers have long taken up bits of and pieces of the planet in their analyses of difference. But here we hint at a deeper, more philosophically inflected finding: that the monstrous emerges *through* the distinctiveness and particularity of umwelts. Inspired by the work of Harding (1986) and Harstock (1986), who invite us to think of knowledge as a kaleidoscope of different standpoints, we put forward the concept of an organism's "standpoint ontology" – a term aimed at capturing the specific, even idiosyncratic umwelts of life itself. This perspectivalism is not anthropomorphized as emergent from within thought or reason, but—following Deleuze—is considered at the level of the molecular. Such a molecular conception of the mosquito's lifeworld is, we argue, central to understanding its monstrosity.

Our theoretical argument is informed by fieldwork carried out in Arizona between 2006 and 2011. The fieldworkers, managers, and health officials we spoke to all expressed the difficulty in eradicating an organism that dwelt within a completely different world to ours, despite the fact that humans and mosquitoes share the same physical space, from bedrooms to backyards. This foremost suggests the spatiality of the monstrous, an individuation emergent from the difference that is the umwelt.

Fig. 1. Tunisia's 1962 'The World United Against Malaria' stamp.

2. A multiplicity of monsters

> "It is called a mosquito—pronounced *moskeeto*—and it is, perhaps, the most tormenting, the most persevering, savage, vicious little monster on the face of the earth. Other flies go to sleep at night; the mosquito never does. Darkness puts down other flies—it seems to encourage the mosquito. Day and night it persecutes man and beast, and the only time of the twenty-four hours in which it seems to rest is about noon, when the heat puts *it* down for a little. But this period of rest strengthens it for a renewal of war during the remainder of the day and night. In form the mosquito very much resembles the gnat, but is somewhat larger. This instrument of torture is his nose, which is quite as long as his body, and sharper than the finest needle" (Ballantyne, 2007, np).

From bedtime beasts to vampiric vectors, monsters roam the popular imagination. But they also stalk philosophical landscapes, posing challenges to modes of thought that clamber for certainty. In this section we briefly explore a few intertwined approaches to monstrosity. Whether pivoting on the leftovers from the "order of things" or on the unsettling pleasures and fears that arise in crossing the borders of psycho-sexual normativity, monsters are often unified in the disruptions they bring to epistemic "truths". Our purpose in discussing these disruptions is not to be comprehensive, but rather to signal the monster's historical presence within the deepest recesses of Western thought. It is also to set the stage for a complementary reading of monstrosity situated in the thought of Uexküll.

Foucault's life work revealed the discursive systems through which ab(normality) was produced and maintained, whether in terms of sexuality, criminality, or sanity. In doing so, he critiqued the entrenched logics that structured post-Enlightenment thought and practice (see also Derrida, 1995; Haraway, 1991). And indeed, one might say that the monstrous was a central part of the architecture of Foucault's thought: "The monster is problematic,