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The world in a box? Food security, edible insects, and "One World, One Health" collaboration

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ABSTRACT

Scientists in the Netherlands are cultivating edible insects to address concerns of international food security. Committed to the *One World, One Health* (OWOH) movement, their research aims to create a safe and effective *global* solution to the conjoined problems of climate change and an increasing worldwide demand for protein. Their preliminary work is promising, as it suggests that when compared to other sources of meat, insects can be an efficient, safe, and low-impact source of nutrients. Additionally, in many sites with endemic malnutrition, people find insects tasty. The problem these scientists are grappling with, however, is that insects that are easily mass-produced are not the insects people typically want to eat. This paper shows how the contingency of edibility complicates existing scientific models of travel that posit that singular objects spread peripherally outwards from a center into a globally connected, singular world. The scientists are finding that the production of successful food products necessitates that insects be constantly tinkered with: there is no "insect" that can be globally edible since "the global" itself is not a singular entity. This in turn complicates the vision of replicability and "scaling up" inherent in an OWOH vision of science. The researchers' process of moving their goods from the laboratory boxes they work with into the mealtime practices they seek to impact is compelling them to cultivate and articulate new ideals for research, methods of translation, and pathways by which goods can travel. They are finding that if they want to affect the health of "the world," they must engage with many different worlds.

1. Introduction: science for impact

The researcher meets me in the lobby of the entomology building, where a sculpture of a giant butterfly peers down on us. Its yellow wings open up, their tips pointing to the motto "*Science for Impact*." I am there to observe the researcher's strategies for addressing food security. His team, based out of Wageningen's Laboratory of Entomology in the Netherlands, received a grant from the Food and Agriculture Organization (FAO) for research in sustainable agriculture. The grant emphasized global hunger and climate change. As we pass through the chip-activated glass gates the researcher speaks of a rising worldwide demand for protein and widespread malnutrition. His language is ambitious, his aim expansive.

When we reach his temperature-controlled lab, he unlocks a dark closet at the back of the room and takes out a small brown box in which he is conducting his experiment. I see dozens of small mealworms crawling through the surface of the soil. He asks me to guess how many there are, and though I guess high, he laughs, telling me there are at least three times that many. He suggests that a solution for global hunger is materializing in this small box, proclaiming with pride: "Edible insects can feed the world."

Feeding the world is a goal of both this project and the UN organization that granted it funding. The FAO is among many organizations that have recently partnered to address concerns for food security by building a "common vision" through a "common language" (FAO, 2013). The effort to forge "co-equal, all inclusive collaborations,"[1] stems from the holistic idea that uniting a range of perspectives will benefit the greater good. Security is enhanced by "collaborative efforts of multiple disciplines working locally, nationally and globally" to improve *the* health of *the* world (AVMA, 2008). A premise of this collaboration is that health innovation that works in one site should lead to standardized intervention, design, and implementation so as to be easily "scaled up" (Bloom and Ainsworth, 2010; Jarosz, 2011). An expert report on the topic explains: "scaling up expands, replicates, adapts, and sustains

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[1] http://www.onehealthinitiative.com/, last accessed October 1, 2013.

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successful policies, programs, or projects to reach a greater number of people" (Linn, 2012). Whether scaling up is implemented as horizontal replication (from one site to another) or vertical replication (from local to national policies) this language of replication depicts the smooth, linear distribution of resources from one location to a shared, singular world.

The scientist in the edible insect lab similarly wants the contents of his box to spread from his lab to distant peripheries of the world. He describes an outward global diffusion of his work: the replication of the edibility he is in the process of producing to faraway sites. Yet as I spend more time studying the research being carried out in the lab, I learn that this model of expansion is not, in fact, working very well. This vision of replication, in which a singular object can be scaled up and then diffused through a singular world, is an attractive concept. But, as I detail below, it breaks down in practice. When the scientist tries to replicate this box, with its thousands of mealworms, in other places, the replication fails. The box, it turns out, is not so much a microcosm of a possible world, nor a fixed object able to travel the world unchanged, but a shifting technology that takes different forms and has different effects as it travels.

Controlling the unpredictable, mitigating exposure to the unknown, and promoting stasis have been tenets of *One World, One Health* (OWOH) biosecurity (AVMA, 2008:9), but the OWOH agenda has developed out of concern for infectious disease, shaped by scientists who work amidst quickly replicating microbes. Meanwhile we (the insect scientists and their ethnographic-observer) are facing different security concerns, as well as different possibilities for transfer and translation. The scientists in the edible insect lab work in the terrain of eating – with its pleasures of ingestion and adoption of styles – and not with concerns of unwanted spread of infection. The risk they confront is not of an invisible, hidden contagion that might strike in the dark (Latour, 1983:147). The risk in the project of improving food security rather, lies in the realm of the familiar: that people will persist in doing what they have been doing, going about their business, activities unchanged.

The work of the edible insect scientists attends explicitly to the conjoined concerns of global, ecological, and animal (which includes, for them, human) health and their lab is publicly committed to the OWOH agenda (cf. van Huis et al., 2013:66), but they are finding that when it comes to global food security, the singularity of a common vision may not be the best approach. This is because they do not simply concern themselves with facts to be unearthed and then replicated within the box, but with practical problems of how a small box can become relevant to the appetites and markets of diverse regions. To travel effectively, the boxes and the insects they carry must be constantly tinkered with—both contents and form adjusted through the process of travel. Rather than diffuse a single object into the world, they must care for the differences and nuances that arise out of shifting contexts (cf. Akrich, 1992; Mol et al., 2010). It is a paradox they have begun to recognize and work to engage: to be effective – to impact *the world* – the box must be kept specific and situated locally.

This article, through its descriptions of the contingencies scientists face when producing edibility, suggests that "the global," at least when it comes to food security, cannot be a singular thing and thus cannot be addressed by a universal approach or commonly-shared solution. Following a brief methods section that addresses techniques of scientific collaboration, the article unpacks results from three of the edible insect scientists' research projects. It details how in their efforts to produce 1) products, 2) appetites, and 3) markets the researchers are learning that edibility must be crafted in specific situations—in response to the needs, regulations, and tastes of specific bodies and infrastructures. The subsequent discussion section illustrates how the contingency of edibility complicates a model for scientific impact in which a singular object spreads peripherally outwards in a replicable, determinate fashion. This leads to concluding reflection upon how challenges faced in work on food security might shift the vision and strategies of OWOH.

2. Methods, para-sitic ethnography

The methods for this research are adopted, conveniently enough given the topic, from Marcus' vision of *para-sitic* ethnography. Parasitic ethnography aims to address the challenge of working through projects and problems with groups with whom there is partial overlap in concern, method, and site. In reference to "experiments" he has conducted at the World Trade Organization, Marcus explains that para-sitic social science enlists collaborations with research counterparts who are themselves involved in reflective consideration about norms of engagement, and, through these collaborations, to creatively examine how ideas central to the organization of their projects "circulate, have effect, and change" (Deeb and Marcus, 2011:52). The metaphor of the parasite is employed not to invoke relations of exploitation (one entity destroying another), but rather, to highlight relations of dependence upon which all collaborations are based (see also Serres, 1982). Collaboration is here figured as a means of creating novel research approaches in a way that draws from others, while maintaining differences.

Since March, 2011, and in accordance with the research ethics guidelines of my university, I have spent time in labs and at their public meetings including a large outreach program aimed at children and several academically oriented scientific presentations at global health and agricultural conferences; I have reviewed PowerPoints and edited publications; and I formally interviewed eight of the project's participants, including the director. We have eaten together (yes, insects, though not exclusively), watched *The Simpsons* (an episode on eating insects), and held many lively debates over email as we have ourselves traveled between the Netherlands, Rome, Laos, Central America, Kenya, Malawi, and the United States. Still, the work of the researchers I detail here is, like the worlds in which they work, in the making. There is no end to the project of cultivating edibility and as they continue to experiment, I am engaged in experimental work alongside them. This collaboration is, like the research process itself, unchartable territory, an experimental system in Rheinberger's sense where not just knowledge, but its pathway of assembly, is emergent (1994).

While the scientists' work is an intervention into food security, my work is, in many ways, an intervention into theirs. It is not an intervention in the form of critique, but one meant to bolster and sharpen their aims, to contribute to their concerns, and to aid in the impact(s) of their work. In many ways this article describes what the scientists already know, but by approaching their research with my social scientific skillset, I hope to give additional shape to their findings. After sending an earlier version of this article to the entomology team, one of the researchers responded, "I must say that it is very different from what I do, but that there are many elements in there that resonate with me." It is such *resonance* – rather than replication – that is an aim of para-sitic methods. In the multi-sectoral OWOH field of global sciences, integration and "a common vision" are the rage. In contrast, this article is an experiment in collaboration (see also Choy et al., 2009; Kelly et al., 2010) that aims to enhance without duplicating the scientists' results.

3. Results I: local, temporal biologies

Mealworms are the staple insect for the scientists in the edible insects lab. They also work with beetle larvae and grasshoppers, but