**Abstract:** By installing fog catchers in the hills around Lima, Peru, conservationists seek to transform fog into water for use in infrastructures of fog oasis reforestation. This article describes the devices and techniques of inquiry through which fog was gradually rendered catchable. These relational engagements with the atmosphere, and the multifarious forms that fog assumed along the way, will be used to reflect on the possibilities and limitations of speculative realism for more-than-human ethnography. Particularly relevant is Graham Harman’s notion of ‘vicarious causation’, which denotes how things located outside thought can be accessed vicariously and partially, for example, through allusion. My contention is that this concept may be productively adapted for ethnographic inquiry if repurposed to fit with an open-ended and relational understanding of the outside.

**Keywords:** atmospheres, conservation, fog capture, more-than-human ethnography, object-oriented ontology, speculative realism, water

We are in the Majes district, a two-hour drive away from the city of Arequipa. Surrounded by fine-grained sand, small air plants latch tightly onto one another. Some are gathered in stripe-like patterns over the sand dunes, others in large conglomerations. Manuel explains that he and his biologist colleagues are undertaking several studies in the area.¹ They are examining the relationship between these plants and the coastal fog that rolls in from the Pacific on a regular basis. The ocean is visible in the distance, strikingly blue and contrasting sharply with the arid desert landscape.

Assisted by two Spanish undergraduate volunteers, Manuel’s colleague, Diego, has already begun to unearth a plastic water container. The biologists keep the containers buried next to their fog catchers (*atrapanieblas*) so as to prevent the
collected water from evaporating in the sun. After writing down the volume collected in his notebook, Diego empties the container over the mesh, removing the dust stuck between and along its threads. He then reattaches the hose to the opening of the container, seals it with duct tape, and places the container back into the cavity, covering it with sand (fig. 1). This procedure is repeated several times before we leave Majes in our white 4x4.

Once back in their office at a university in Arequipa, I sit down with Manuel and three of his colleagues to learn more about their research. The biologists tell me about their previous activities in a coastal fog oasis ecosystem (*oasis de niebla* or *loma*) in the Atiquipa district farther north, where they had used fog catchers to probe the viability of tapping into ground-touching clouds as an alternative water source for reforestation purposes (fig. 2). Their current research in Majes is purely scientific, as is another project carried out by their Chilean collaborators across the border in the Atacama Desert. They are also studying coastal fog, but in addition to fog catchers, they make use of lamps to investigate long-term changes in the fog’s elevation.

One of the biologists describes this method with great excitement: “During the daytime you clearly see the cloud entering, right? But at night you know nothing about its behavior [*comportamiento*].” Hence, the geographers running the project have installed a series of lamps, one above the other, at 100-meter intervals along the height of a hill. The installation helps to determine the location and thickness of ground-touching clouds in pitch darkness. As the clouds

**Figure 1:** Biologists at work in Majes. Photograph © Chakad Ojani
roll in from the coast, they prevent the light from reaching a camera recording the setting from a distance, with a view of all the lamps. In this way, the fog reveals its own thickness and spatial location at any given moment by the lamp it prevents from being recorded by the camera, through the traces it leaves on a luminous setting. “What’s going to happen? Will the fog rise or sink, or what is it that will happen?” my interlocutor asks.

The fog catchers in Majes foreground certain aspects of fog by transforming it into a volume of measurable water. By engaging with it as something to capture and contain, the biologists aim to examine the relation between ground-touching clouds and coastal vegetation. In contrast, in the Chilean experiment, some of the other features of the fog are made visible as it hides the lamps. By creating an experimental setting in which fog can leave traces, the scientists learn about its thickness and movement across space and time. In both cases, an elusive and ephemeral atmospheric phenomenon is rendered knowable through the difference it makes, or is made to make, to its own surroundings.

The activities of these scientists are illustrative of a wider, emergent attunement to fog as a potential water source in coastal Peru. Major cities in these areas depend on rivers that originate in the Andes, but glacial retreat and rapid urban expansion increasingly raise concerns about water scarcity and the gradual disappearance of coastal fog oasis ecosystems. Consequently, over the past
decades, the regular inflow of ground-touching clouds has been perceived by some actors as an alternative water source for reforestation, small-scale agriculture, and human and non-human animal consumption. By installing large fog catchers in the hills around Lima and other coastal areas, NGOs, residents, scientists, and conservationists try to enroll this atmospheric phenomenon in infrastructures of fog oasis restoration and small-scale water supply systems in neighborhoods where state infrastructure is missing.

Drawing on 12 months of ethnographic research on these material engagements with the atmosphere, undertaken between July 2018 and July 2019, in this article I focus on fog capture as a technology of fog oasis conservation in the hilly peripheries of Lima. I do so by following the work of Sergio, a geographer who had been appointed by the United Nations Development Programme (UNDP) to gauge the possibility of using fog as an alternative water source for reforestation. By describing Sergio’s relational engagements with ground-touching clouds, including the multifarious forms that fog took over the course of this study, I aim to highlight a number of congruities between two elements: the by now widespread ethnographic interest in multiplicity and the more-than-human (e.g., Omura et al. 2019), and the philosophical movement known as speculative realism, oftentimes perceived as suspicious among anthropologists (but see Breen 2021). The purpose is to examine how the analytics of speculative realism might be put at the service of ethnographic inquiry, while avoiding the epistemological hierarchies that speculative realists are arguably informed by (see Holbraad and Pedersen 2017: 26; Jensen 2013; Jensen et al. 2017).

Ethnographers have had difficulty in finding common ground with the underpinning universalisms of most, if not all, speculative realist frameworks. The concern with the emic among ethnographers is directly at odds with the strong inclinations toward Western scientistic discourse often found among the proponents of this philosophical movement. And when such proclivities are absent, claims about being a ‘theory of everything’ (Harman 2017) will almost certainly be met with skepticism. Still, as I shall argue, the shared interest in partiality found in the work of some speculative realists is suggestive of potential contact zones where ethnographers might be able to draw out productive analytical resources.

Anna Tsing (2019) has commented that the challenge of more-than-human ethnography is that non-humans seldom speak in human languages. She mentions a number of techniques that help bypass this problem, among which are both scientific and vernacular forms of knowing the other-than-human, as well as various kinds of non-textual media that may render visible things that are difficult to grasp through language. Crucially, each such technique reveals only certain aspects of the phenomenon in question. I encountered a similar disposition among my interlocutors in coastal Peru, exemplified in the opening vignette, where ground-touching clouds were apprehended by proxy through a plethora
of techniques and devices. This reflects an understanding of non-human entities that parallels some versions of speculative realism, not least Graham Harman’s object-oriented ontology, according to which objects always interact vicariously. Harman’s (2007) concept of ‘vicarious causation’ suggests that while insusceptible to subsumption, things located outside thought can nonetheless be accessed indirectly and partially. My contention in this article is that vicarious causation may be productively repurposed for ethnographic inquiry if tweaked to fit with a relational and open-ended understanding of what the outside can be. I begin by outlining the central tenets of Harman’s version of speculative realism.

Vicarious Causation

The particular strand of speculative realism that will be drawn upon in this article goes under the epithet ‘object-oriented ontology’. Yet the umbrella term ‘speculative realism’ denotes a broader trend. Coined by Ray Brassier, Levi Bryant, Graham Harman, and Quentin Meillassoux as the title for a 2007 conference at Goldsmiths, speculative realism is a philosophical movement that is concerned with trying to escape the ‘correlationist circle’ (Meillassoux 2009), according to which “we cannot think of humans without world, nor world without humans, but only of a primal correlation or rapport between the two” (Harman 2009: 122). The consequence is that “what lies outside thought must always remain unthinkable” (Harman 2010: 789). Although authors associated with the speculative realist movement disagree about how this problem should best be solved, and while some of the movement’s original proponents have by now given up the speculative realist label, what initially brought these thinkers together was an urge to acknowledge the existence of objects and “the great outdoors, the absolute outside” (Meillassoux 2009: 7; emphasis omitted) independently of their relation to a human subject. This is a task that phenomenologists and most post-structural thinkers are either deliberately reluctant to pursue or, according to the speculative realists, philosophically ill-equipped to undertake (see Sparrow 2014).

Harman’s (2011) way of preserving the autonomy of the outside has resulted in his notion of the ‘quadruple object’, encompassing everything from fictional characters to organizations and stars. In this scheme, any given object is a result of a series of tensions between real object and sensual object, real qualities and sensual qualities. In brief, this amounts to a separation between object and qualities, further entailing that objects never interact directly but indirectly, via their respective qualities. The term that Harman (2007) reserves for this type of interaction is ‘vicarious causation’, an aesthetic form of relationality that never exhausts an object’s “unexpressed surplus” (Harman 2016: 43) but translates it, for example, through allusion, metaphor, or various kinds of material intervention that lay bare a given entity’s otherwise inconspicuous qualities.
non-human notwithstanding, no two objects ever fully touch, but always remain partially opaque to one another. In consequence, an essential part of each object is always unavailable to relationality, a point that Harman often illustrates with reference to the Occasionalist example of how fire burns cotton without coming into direct contact with all of the cotton’s properties.

It is not difficult to see why Harman’s framework might come across as problematic among ethnographers who seek to challenge pre-analytical assumptions by remaining attentive to interlocutors’ definitions. In deciding how things are constituted prior to ethnographic encounters, we risk becoming insensitive to emic accounts (Holbraad and Pedersen 2017: 35–36). In her remarks on Timothy Morton’s (2013) version of object-oriented ontology, Hannah Knox (2020: 112) raises a related critique: in being “both coherent and excessive, here and faraway, present and existing in the future,” Morton’s notion of ‘hyperobjects’ suggests “a collapse of the relationship between self and world” and, ultimately, the world itself. Rather than accepting this non-relational scheme, which is also present in Harman, Knox proposes that we hold within view more than one version of the world simultaneously.

Conveniently, cultural critic Steven Shaviro (2014) offers an interpretation of aesthetics that retains Harman’s concept of vicarious causation while avoiding both non-relationality and a rigid definition of the outside. He does so by not suggesting direct contact, but “contact-at-a-distance” (ibid.: 118), which, akin to object-oriented ontology, involves allusion without subsumption or total apprehension. Using himself as example, Shaviro contends in this connection that “something that is not mine, and that I cannot assimilate into myself, is nevertheless directly communicated to me. I do not get to know the thing, but I allude to it, transforming it over a distance” (ibid.: 151). In this way, Shaviro rejects Harman’s vision of objects insulated in fixed vacuums while simultaneously sidestepping the straightjacket of correlationism. Consonant with object-oriented ontology, this aesthetic form of relationality applies to human and more-than-human relations alike.

These critiques and modifications aside, the way ethnographers inquire into the other-than-human by proxy presents striking parallels with Harman, for whom objects exist independently of human thought but may assume an inexhaustible number of expressions depending on the manner in which they are engaged. My main interlocutor in this article, Sergio, exhibited a similar disposition by approaching ground-touching clouds vicariously, bringing them into view differently on each occasion, sometimes as relational processes and at other times as constituted by smaller parts, both of which represent understandings of objects that Harman disqualifies, a point that I return to in the analysis. By showing how Sergio apprehended fog in these various forms successively, I will suggest that he followed Harman’s vicarious approach to objects yet avoided object-oriented ontology’s insistence on deeper, underlying essences. This calls
for an ethnographic attitude toward the atmospheric that, like speculative realism, brackets phenomenology—not in order to preserve a monolithic outside, but to make room for heterogeneous versions brought into apprehension partially and vicariously.

### The Ethnography of Atmospheres

Over the past decade, social scientists have increasingly directed their attention to atmospheric phenomena, in particular their affective capacities (e.g., Choy and Zee 2015; Ingold 2007a; Schroer and Schmitt 2017; Stewart 2011). Anthropologists Sara Asu Schroer and Susanne Schmitt (2017) trace this interest back to Émile Durkheim’s and Marcel Mauss’s aspirations to understand the atmosphere of rituals, gatherings, and economic exchange. However, it is arguably also rooted in the ways in which air pollution and changing climates have made atmospheres increasingly palpable for social scientists as well as other breathers (Choy and Zee 2015).

While most such research attends to atmospheres mainly as empirical objects, several scholars have also deliberated on their conceptual ramifications. For example, Kathleen Stewart (2011: 445) formulates the notion of ‘atmospheric attunement’ to denote “an intimate, compositional process of dwelling in spaces that bears, gestures, gestates, worlds.” An anthropology of such attunements in turn requires a form of “writing and theorizing that tries to stick with something becoming atmospheric, to itself resonate or tweak the force of material-sensory somethings forming up” (ibid.: 452).

Drawing inspiration from Stewart, Timothy Choy and Jerry Zee (2015: 217) propose an Aeolian, atmospheric anthropology that could be, as they say, “moved and pulled with the air.” In another article, Choy (2018) discusses apparatuses, practices, and methods that either hold or attend to materials in atmospheric suspension, suggesting that anthropologists study and perhaps even develop their own apparatuses of atmospheric attunement to elicit other kinds of elusive phenomena. This resonates with, for instance, Cymene Howe’s (2015) proposal that we ‘deterrestrialize’ thought by orienting anthropological attention to materials that are skyward and atmospheric, as well as notions such as aerial thinking, invoked by geographer Craig Martin (2011) to denote how thought may suddenly be released from states of potentiality. Analogous to how social theorists have long thought about finance, migration, and global connections through seawater (Helmreich 2011), in recent years the atmospheric can be said to have “disappeared into our heads” (Michael Taussig, quoted in ibid.: 137), slowly permeating our conceptual apparatuses to theorize and describe a myriad of other things.

However, fog capture in coastal Peru encourages a concern not with “atmospheric sensation” (Choy and Zee 2015: 219n7) or the “lived affect” (Stewart
2011: 452) of foggy milieus, nor the way in which anthropologists might seek atmospheric metaphors to describe something else. Instead, the UNDP geographer Sergio’s shifting relations with fog, which I shall describe in a moment, call for an approach that is flexible with regard to what fog is and what it can do. Like the speculative realists, we need a framework that sidesteps strictly phenomenological concerns. This leads me to Knox’s (2020) eloquent ethnography of climate change and urban governance in the city of Manchester, in which the author invokes Tim Ingold’s (2007a) influential phenomenological understanding of weather to differentiate Knox’s (2020: 4) own object of study: “If weather is inherently phenomenological, weather-as-climate enters perception by means of scientific instruments of detection and models of projected effects that refract lived worlds through the prism of historical and global processes traced in graphs, charts, and diagrams.” An ethnographic account of material engagements with fog might be expected to find resonance in phenomenology. Yet the multifarious forms that fog assumed over the course of Sergio’s study brought it closer to the kind of object that Knox is concerned with.

Rather than outlining a pre-analytical definition of fog’s material properties or affordances, then, what we need is an approach that remains attentive to how such characteristics take shape in the field (cf. Ingold 2007b). Knox provides a compelling framework by turning to Eduardo Kohn (2013) and Gregory Bateson ([1972] 2000), for whom the question concerns not the reality of a given object but its pattern or form. In this way, “things and data and their interpretation by humans or machines can all be addressed on the plane of signs” (Knox 2020: 7; emphasis in the original).

Privileging the affective capacities of ground-touching clouds as exclusively atmospheric phenomena would disregard their appearance as traces, data, droplets, or a volume of measurable water, all variously present throughout the different stages of Sergio’s study. Knox’s symmetrical disposition agnostically allows for such forms to emerge ethnographically, without settling on any particular understanding of what fog is. It is also better in tune with the notion of the unlimited expressions of any given object as maintained by object-oriented ontology, including the understanding that these come about vicariously—in Sergio’s case, through a plethora of devices and techniques of inquiry.

Before turning to Sergio’s activities in Lima, I contextualize my account by providing below a background to fog capture in coastal Peru more broadly.

**Fog Capture as a Technology of Fog Oasis Conservation**

Although potentially preceded by a centuries-long history of human engagements with fog along the South American Pacific coast, systematic experiments with fog catchers began to be undertaken in the Atacama Desert around the
mid-1980s. A decade or so later, similar endeavors by local and international teams of geographers and biologists also sprang up in coastal Peru. These experiments were conducted in the context of scientific research on the relationship between fog and coastal vegetation, and to gauge the possibility of tapping into these ground-touching clouds for the purpose of fog oasis ecosystem restoration.

In recent years, several initiatives have likewise been undertaken in the hills around Lima. Constructed in situ, the fog catchers deployed typically consist of a large nylon or plastic Raschel net that is stretched between two vertically positioned poles and situated perpendicular to the direction of the incoming wind. The size varies depending on use: scientists usually opt for standardized one-square-meter fog catchers to make results comparable across locations, whereas those intended for use as alternative water supply systems consist of larger screens so as to collect as much water as possible. Ideally, these larger structures are held in place by concrete foundations buried underground, as well as a series of steel cables leading down from atop each pole and hooked onto ground anchors (see fig. 2). Carried by coastal winds, the tiny water droplets bump into the net and trickle down into a slightly inclined gutter, positioned horizontally below the lower edge of the screen. The water gathers at the lowest point of the gutter and is funneled into a tank or reservoir where the water is stored.

Fog oases are ecosystems that, in the absence of rain, are inextricably entangled with this yearly inflow of coastal fog, which gets captured and distributed as fog drip by rocks and the dry vegetation, activating seeds and bulbs hidden in the soil. Over the past centuries, the ecosystems that these processes yield have been critically damaged, initially by various forms of exploitation, such as agriculture and the use of trees for fuel, and in recent years by a rapid increase of new neighborhoods around Lima’s outer edges. Much can be said here about the politics of urban fog oasis conservation and its enmeshment with the city’s long-standing history of informal urbanization, marginalization, and inequality. Having accounted for these issues elsewhere (Ojani 2022), I leave such questions aside in this article. Instead, I follow the work of Sergio as he deployed techniques similar to those used by the biologists in the opening vignette to identify the locations in the hills where fog was ubiquitous and traveled with enough speed so as to successfully bump into a fog catcher.

Sergio’s activities formed part of a project that aimed to protect a number of fog oasis ecosystems from further disturbance. Given his previous experiences of atmospheric water collection in a Peruvian cloud forest, Sergio had been appointed to investigate the possibility of using fog as an alternative water source for the infrastructure of reforestation (infraestructura de reforestación) that a number of civil society conservationist associations hoped to implement in their respective districts. Over a period of several months, he accepted help from association members and volunteers, including myself, to set up
a weather station in three of the city’s southern and northern districts: Villa María del Triunfo, Comas, and Carabayllo. Based on his conclusions from the collected wind data, Sergio gradually decided on a number of locations that he deemed potentially promising for fog capture. We then assembled provisional one-square-meter fog catchers to gauge the volume of water that could be generated at the given sites. Apart from testing the potential for fog capture, the data gathered would work as evidence in a technical report that Sergio was to produce once the study had been finalized. This would help the UNDP and the conservationist associations to secure funding for the larger fog catchers that they were planning to eventually install in the hills.

In what follows, I describe Sergio’s shifting modes of engagement with fog, as well as the techniques of inquiry he deployed over the course of his study. I chart how ground-touching clouds were made to emerge multifariously by means of a number of different relations: to vegetation and topography, of wind speed and direction, and among and between water droplets and the material dispositions of fog catchers. As I will show, the focus of Sergio’s study gradually shifted to ever-new relations, which were in turn tapped into successively and vicariously through a series of disparate devices. Accordingly, from the perspective of research undertaken at the interface between science and technology studies (STS) and anthropology, Sergio’s study can be interpreted as laying bare some of the efforts and multiplicities involved in enacting an elusive and ephemeral atmospheric phenomenon as a volume of measurable water. To paraphrase a recurring observation in STS and more-than-human ethnographies (e.g. Omura et al. 2019), at once “more than one” and “less than many” (Mol 2002: 55), for fog to emerge in this form, other possibilities are drawn upon and pushed into the background. However, rather than using Sergio’s relational engagements with fog to reiterate a by now well-versed argument about the shortcomings of a ‘one-world world’ (Law 2015), I will contrast his study with object-oriented ontology to reflect on the possibilities and limitations of speculative realism for more-than-human ethnography more broadly considered.

Next, I account for Sergio’s vicarious approach to ground-touching clouds, including some of the forms that fog assumed throughout the different phases of his quest for catchable fog.

**Catchable Fog**

**Phase One**

A fine sand lifts off the ground behind us. Moss loses its shape under our feet; it is almost pulverized. The arid landscape does not tell much about everything
happening silently beneath, where bulbs are slowly preparing for the incoming fog in a few months’ time.

“Look,” Sergio says, “the ecotone!” He is pointing at a line in the ground, marking a difference in the vegetation. There is a shift from the thick layer of moss on which we are currently standing to a considerably thinner one a few steps ahead, where there are none of the more robust plants growing farther down. Sergio speculates that the line signals a change in the speed with which fog travels across the hillside. It moves faster higher up, which is to our advantage, as it will cause water droplets to bump into a future fog catcher with higher frequency and force. I recognize this attention to the vegetation from previous occasions when we have been gauging the landscape for convenient spots to set up our weather station. When we climb the hills, Sergio is often attentive to how rocks are covered with moss in some places and not in others. As he has explained to me, “one has to find places where a good vegetation, signaling that there is humidity in the air, co-exists with evidence of sufficient wind, which controls [the vegetation] but still permits the generation of biomass.”

Over the months spent with Sergio, I learned that one of the requirements for successful fog capture is that the fog needs to be relatively permanent and sufficiently intense. Yet such thickness impedes us from observing variations in the intensity and movement of the fog across different locations. Sergio therefore tried to get at these variations by interpreting changes in the vegetation as indices of fog’s spatiotemporally situated properties.

But Sergio was not always entirely sure if differences in the landscape really signaled the changes he sought, and whether he interpreted such traces correctly, including whether and how they really mattered to what he was trying to determine. His treatment of environmental differences as indices of fog’s changing intensity and movement were to a large extent speculative. Much like the classic example of how smoke is the index of fire, despite the fact that smoke can arise in the absence of fire, these differences were but preliminary hypothetical inferences. As he often explained during meetings with fog oasis conservationist associations around the city, these clues were far from enough, but they elicited additional relations that, in turn, demanded further investigation.

Another issue that raised uncertainty with regard to how and to what extent changes in the vegetation really mattered was the fact that Sergio was on a quest for catchable fog. As he explained to one of his audiences: “The presence of vegetation doesn’t automatically mean that a given point lends itself to successful fog capture … Fog is one thing. The capacity to capture it is something else … It’s true that vegetation shows that there is fog, but you have to conduct a study to find out whether it’s really possible to capture it.” The wind cannot be too strong, as this would prevent the water droplets from trickling down into the gutter by blowing them off the mesh. Nor should the wind enter from too many directions. Plants, he explained, capture fog from all angles. In contrast,
fog catchers have only two sides. Fog must enter from only one direction or, alternatively, from two opposite directions—at least predominantly.

**Phase Two**

The reader will note from the previous section how Sergio’s study brings into apprehension ground-touching clouds as intrinsically relational. Sergio gets at some of fog’s situated properties vicariously by means of these relations. His focus on traces approaches this atmospheric phenomenon through the things it affects, which in turn raises questions about the forces by which fog is actively being affected. In this connection, a weather station allows him to visualize changes in wind speed and direction, so as to discriminate more effectively between locations (fig. 3).

A few weeks after having set up weather stations at a number of different sites, chosen on the basis of Sergio’s preliminary observations of the vegetation and topography, we sit down in his home to transfer the collected data onto his laptop. While sorting the data points into columns according to the different points of the compass, Sergio notes that the list representing measurements from one of our locations is predominantly made up of registrations from north-west-north and south-east-south. “This point is very potent,” he says, big-eyed. “The wind comes in from two directions!” Being diametrically opposed, these could be perpendicular to the two sides of a future fog catcher. He starts converting data from all of our measured locations to fit within a 360-degree scale, and it soon becomes even more evident how this particular location differs from the other places we have measured thus far. Nothing enters from the south, which it does elsewhere. Sergio explains that the wind almost certainly blows in from the south here too, but that it is then steered in a slightly different direction by a steep, obstructing hill that we had noticed when setting up the station. He speculates that it is in fact much better when the hill is sharply inclined: “This is to our advantage, because the wind enters much more rapidly.”

Once all the registrations have been converted into degrees and sorted into their respective columns, it is time to save them into a single file, which will then be transferred to software used especially for visualizing weather data. It is not long before our data points are distributed into a series of circular histograms, each representing one location. Sergio’s early observation of the two predominant wind directions becomes much more obvious. He then goes on to create a series of line charts, two for each day’s data points. The first chart represents fluctuations in wind speed and the second in wind direction. Placing the two graphs on top of one another in turn reveals temporal coincidences between them. “Look,” Sergio says, “as soon as the wind speed starts to increase, the direction shifts toward northwest.” He draws my attention to how the points representing higher wind speeds on the first graph intersect the
Figure 3: Sergio setting up the weather station. Photograph © Chakad Ojani
points representing northwest on the second graph. The same holds true for all three days.

**Phase Three**

On the basis of the elicited relations between wind speed and direction, Sergio later assembles and installs a series of provisional one-square-meter fog catchers at the sites he considers the most promising. I notice how at this point, once he starts to think more closely about the moment of capture itself, fog suddenly becomes conceptualized in terms of relations among and between water droplets and mesh.

The importance of attention to these relations had already become apparent to me in a conversation with a biologist whom Sergio had invited to the UNDP's office in Miraflores. Several years ago, the biologist had participated in a conservation project in the Atiquipa fog oasis ecosystem, together with the Arequipa-based scientists mentioned earlier. In response to my question about the materials they had used for their fog catchers, the biologist used a napkin to sketch out the triangular patterns of a Raschel mesh, suggesting that it more effectively accumulates water droplets when the length of the triangles points downward:

> What you need is a net that goes something like this … The water droplets accumulate here and start traveling all the way down to the gutter. But if you put it this way [with the triangles pointing horizontally], they will get stuck, and the wind will blow [the droplets] away easily. So, it has to be this way [with the triangles positioned vertically], because the journey down [into the gutter] is quicker like this. You see? The same net, the same altitude [over the ground], everything, but with the correct disposition.

On a trip to Atiquipa, I discovered that very little of his project remained. Several of the fog catchers had been disfigured and bent into strange and unlikely shapes by the wind. Hence, when trying to come up with ways to capture as much of the water droplets as possible, one must simultaneously make sure to allow for the wind to escape through the mesh. Finding a balance between these two concerns requires a shift to an understanding of fog in terms of its constitutive parts.

This shift happened for Sergio too. When purchasing components for his preliminary fog catchers, Sergio is particularly careful to pick what he has concluded to be the most convenient type of mesh. Having consulted various articles on experiments with fog catchers, he seeks a Raschel mesh with a 35 percent shade rate.\(^5\) As he explains, “if we choose a higher shade rate, say 60 or 70 percent, the fog will just treat the fog catcher as if it were a wall, and find ways around it.” Not only would the water droplets escape, but the pressure caused by the wind would become too strong for the fog catchers to resist.
This turned out to be a good choice. After installing our first one-square-meter fog catcher in the hills in the Villa María del Triunfo district (fig. 4), Sergio is surprised to encounter a nearly full 20-liter bucket the next day, which he thinks cannot be the consequence of mere dripping. There is simply too much water. At home, he has tried leaving a bucket under the tap overnight, and it turns out that dripping alone in no way adds up to anywhere near 20 liters. Sergio speculates that there is a certain time span during which the water droplets are larger and more susceptible to capture. He cannot see how else one of our one-square-meter fog catchers could accumulate 20 liters over a single day.

Our collected data has been sufficient for this particular phase of the study. Yet with the surprisingly large amounts of water in mind, Sergio later points out that it would be helpful to also take other factors into account, not least daily fluctuations in the level of humidity. This would allow us to examine the relation between changes in the presence of fog, on the one hand, and wind direction vis-à-vis speed, on the other. He considers this to be crucial because low humidity means that there is nothing for the wind to push and filter through the mesh. The two graphs representing wind speed and direction would have to coincide with a third graph. Regrettably, our instruments are insufficient to determine when exactly this happens. Besides, to the extent that our equipment is apposite, it is not always safe to leave it unattended overnight. We simply have to assemble and set up the fog catchers in a number

![Figure 4: One of Sergio’s provisional fog catchers. Photograph © Chakad Ojani](image)
of potentially promising locations based on our wind data and see which performs best, based on how quickly each 20-liter bucket fills up.

From Relation to Relation

As we have seen, each relation elicited another, and this happened through a process whereby one set of relations gradually created the conditions for the appearance of the next: vegetation spoke of fog’s presence and relation to wind, which was then examined with the help of a weather station. Upon selecting a number of potentially promising locations, the subsequent use of fog catchers in turn raised questions about the relation between water droplets and mesh. And as soon as this relation faded into the background, new questions arose as to the relation between wind and daily fluctuations in levels of humidity. Each set of devices, techniques, and modes of inquiry helped to bring fog into view relationally, vicariously, and partially.

This was also the case at the outset of the process, before wind speed was of concern, let alone the changes in humidity, which Sergio believed would help to augment the accuracy of his study even further. In our early days with the weather station, Sergio consulted a large map that he had prepared in his office. With the help of some mapping software, he had marked out a number of potential locations on the basis of the relationship between coastal winds and the topography of the landscape (fig. 5). At these sites, fog was expected to be successfully sieved through a fog catcher by a steady and relatively predictable wind, although, as he would later explain, “the topography only tells you where to put the [weather] station … The topography is illustrative only as an early clue, but then other factors start to play a part.”

Accordingly, each relation was but a temporary lever that took Sergio to the subsequent phase of his study. This pragmatic attitude resonates with Penny Harvey and Hannah Knox’s account of field laboratory practices in the context of road construction engineering in Peru. In contrast with classic ethnographic accounts of scientific laboratory practices (e.g., Latour and Woolgar 1986), Harvey and Knox (2015: 98) explain that this work is not oriented toward “a search for robust truths,” but rather “the specific pragmatic end of making a material structure that [can] endure within the parameters of particular conditions.” And as for the mathematical tools used by these engineers, “as long as they continue to work, they continue to be used” (ibid.: 108).

Similarly, Sergio allowed himself to be moved between relations not because they afforded a more exact account of the nature of fog: each relation was not a means toward a more accurate “description of a previously unknown world, but rather provided a means of redescribing, or translating, a relationship that was already known in other ways” (Harvey and Knox 2015: 99). By the same
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token, fog was never reduced to any one relation. It was never only a direction or speed, nor was it merely a set of traces, water droplets, or a volume of water. There always remained a surplus or excess—something withdrawn, if you will. Importantly, and as was evident in the way that he spoke about the topography in terms of an early clue, Sergio was perfectly aware of the contingency of his own practices. The different methods and devices that he adopted mattered to him simply because they were what the given stage of his study and its concomitant questions momentarily demanded.

Sergio’s attitude to fog may be productively contrasted with Harman’s efforts to pin down the location of the essence of objects. In outlining his object-oriented ontology, Harman draws a distinction between philosophical traditions that define objects in terms of their relations to other things and those that reduce them to their constitutive components. Whereas the former approach includes theorists with relational inclinations (e.g., Latour 2005), the latter is often associated with traditions seeking to explain objects either in reference to the virtual or pre-individual (e.g., DeLanda 2016) or by breaking objects down into their basic, sometimes mathematical constituents (e.g., Meillassoux 2009). Harman refers to these approaches as ‘overmining’ and ‘undermining’, respectively, and ‘duomining’ in conjunction, and he expresses discontent with how they displace the analysis from the given object itself and, therefore, fail to get

Figure 5: One of Sergio’s maps. Photograph © Chakad Ojani
at the heart of where the essence of objects is actually located—namely, in an unreachable and elusive in-between.  

Sergio’s study both parallels and diverges from Harman’s understanding of objects. As fog was apprehended vicariously and partially throughout the various stages of his study, Sergio enacted both figures that Harman critiques: fog emerged as something made up of smaller, constitutive parts and as something with the capacity to affect and to be affected. Neither of these was by any means a definitive theory about the essence of fog, but left plenty of space for ground-touching clouds to become something other than what they happened to emerge as in any given situation or setting. In other words, the two approaches to things that Harman together refers to as ‘duomining’ do not necessarily contradict his contention that “there must be a surplus in things that is both deeper than its effects and shallower than its constituent pieces” (2017: 50; emphasis in the original). What is more, while Harman reserves for his own version of philosophy and art a concern with “the thin ‘ontological’ band between these two object-reducing perspectives” (Breen 2021: 58), Sergio’s study suggests that the object-oriented ontologist principle of vicarious causation is no less present in those practices that Harman accuses of duomining. Heterogeneous possibilities of inquiry might not allow a straightforward ordering along Harman’s requested criteria, with science and other modes of inquiry on the duomining side and object-oriented ontology on the other. The outsides they present need not be posited against one another; rather, as equally characterized by translation, intervention, or allusion, they may unproblematically co-exist alongside other possibilities and be invoked interchangeably. 

Crucially, Sergio’s study orients our attention toward how each such possibility, regardless of the place it designates for relations, emerges as an effect of a partial engagement with fog undertaken relationally. Given how both figures sprang up throughout the process of Sergio’s study, overmining and undermining can in fact be said to be perfectly congruous with Harman’s own approach, that is to say, they are all disparate ways of apprehending ground-touching clouds vicariously, albeit without adding up to a more complete picture of what or where the Really Real really is or is not. Different possibilities instead served as figures and grounds vis-à-vis one another. As successive points of stability, over the course of Sergio’s study, each possibility was adopted pragmatically and heuristically for the sake of action, gradually fading into the background and bringing about evermore figures.

Conclusion

In an article on the different meanings of the outside found in the work of Carlos Castaneda and Maurice Blanchot, Casper Bruun Jensen (2013) takes
issue with speculative realist Meillassoux’s understanding of the ‘great outdoors’, which, according to Meillassoux (2009), post-Kantian correlationism has long prevented philosophers from saying anything about. As explained earlier, speculative realists are concerned with trying to regain access to an outside decoupled from human categories. What Jensen (2013: 327) objects to is how the outside for Meillassoux is of “a particularly western, and, indeed, scientistic, kind,” accessible only through mathematics and the empirical sciences: “If correlationism can be avoided it is ultimately because of ‘mathematics’ ability to discourse about the great outdoors; to discourse about a past where both humanity and life are absent” (citing Meillassoux). That scientific facts are themselves correlational is entirely disregarded. Informed by his own interest in the STS-informed turn to ontological multiplicity, Jensen suggests that, rather than reducing the ‘great outdoors’ to one, as does Meillassoux, we should expand it “so much that it can virtually encompass any divergent set of elements” (ibid.).

In other words, Meillassoux’s version of speculative realism is strongly at odds with the interest in multiplicity that has sprang up from cross-germinations between anthropology and STS (see de la Cadena et al. 2015). In contrast, my above analysis is suggestive of how other versions of speculative realism might, when tweaked, become repurposed to serve ethnographic analyses that aim to avoid scientistic epistemological hierarchies. Indeed, in another article, Jensen (in Jensen et al. 2017: 532) acknowledges how both strands seek to move beyond anthropocentrism, further commenting that contrary to other speculative realists, Harman cannot be accused of scientism but of “unbridled speculation” (ibid.: 534). By maintaining an idea of objects as essentially withdrawn from their relations to other things, object-oriented ontology risks becoming futile for ethnographers who not only trace (dis)connections and ask “what counts as relations” (Strathern 2020: 102; cf. Holbraad and Pedersen 2017: 242), but deliberately cultivate relationships and maintain a continuous, reflexive awareness of how they relate to their fields.

Certainly, the postulation of objects as inexhaustible by their relations to other things is a useful heuristic for descriptions that aspire to take interlocutors’ insistence on non-relationality seriously (Breen 2021). Beyond this, however, there are noteworthy parallels between Jensen’s desire to expand the outside so that it may encompass anything and Harman’s agnosticism as to what counts as a legitimate object. This also links back to Knox’s Kohn- and Bateson-inspired framework drawn upon earlier to articulate an alternative to phenomenological approaches to the atmospheric. According to that framework, virtually anything—whether ‘material’, ‘immaterial’, or something altogether different—can be treated as interacting on a common plane of signs. While aware of the aforementioned problems of object-oriented ontology and speculative realism more generally, in my above analysis of Sergio’s fog study I have tried to illustrate how
some of the central tenets of object-oriented ontology, and especially its notion of vicarious causation, might still be useful for ethnographers of the more-than-human. Akin to the vicarious methods and techniques used by these ethnographers (Tsing 2019), Sergio and his biologist colleagues in Majes approached fog by proxy through a plethora of devices.

To conclude, given their commitment to a method that always requires having to cultivate relationships, ethnographers may be foreordained to ‘overmining’, if we are to accept Harman’s non-relational definition of the outside. Whether it is objects or concepts that, when inciting dazzlement, puzzlement, or equivocation, are recursively brought to bear on the ethnographer’s own categories, these are always made to do so through specific modes of relating to the field. Still, as I have alluded, ethnographers are mistaken to disregard speculative realism outright, for what else but a form of vicarious causation is ethnographic inquiry anyway?

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Notes

1. I use pseudonyms for all the individuals mentioned in this article.
2. Other scholars associated with speculative realism include Timothy Morton and Ian Bogost. While Meillassoux’s version of speculative realism has been described as “scientistic” (Jensen 2013: 327), Morton’s and Bogost’s versions are literary-philosophical in ways that bring them closer to Harman.
3. Hence, drawing on Martin Heidegger’s classic example of the broken hammer, Harman (2017: 158) suggests that “the dented hammerhead or damaged wooden handle do not express the whole of the hammer—which forever withdraws from view—yet they do belong to the hammer in some loose way.”
4. Note that Shaviro (2014) can still refer to the withdrawn aspects of objects. Didier Debaise ([2006] 2017) offers a similar framework with recourse to Alfred North Whitehead’s distinction between positive and negative prehensions, rather than non-relationality. As Debaise writes: “to reject or to refuse is, in one way or another, to build a link” (ibid.: 74; emphasis omitted). See also Arjen Kleinherenbrink (2019) for yet another Deleuzian speculative realist attempt to replace Harman’s essences with ‘internal desire’ or ‘intensive matter’.
5. The shade rate indicates the amount of light (or, in this case, wind) prevented from entering through the mesh.
6. Harman is not claiming to know what the essences of things actually are. While object-oriented ontology insists that things do have essences, it also maintains that these can only be accessed vicariously, without ever being fully known.

References


