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by

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2019

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Mobility and Environmental Intimacy in Italian Volcanic Zones

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Thesis

Presented to the Faculty of the Graduate School of

The University of Texas at Austin

in Partial Fulfillment

of the Requirements

for the Degree of

Master of Arts

The University of Texas at Austin

December 2019

Dedication

For Gio. May you learn to love the world's movements, and risk moving with it even in uncertainty.

Acknowledgements

This work would not have been possible without the many informants who gave me their time and attention in the field. I especially want to thank all of the residents of the island of Stromboli and the scientists and graduate students of the Stromboli INGV Volcanology Museum. Thank you to all who have guided me in the writing process including, of course, my committee members Circe Sturm and John Hartigan. Many other professors in the UT Department of Anthropology were instrumental in shaping me as a scholar through their instruction including Jason Cons, Craig Campbell, Courtney Handman, Kathleen Stewart, and Arlene Rosen. Thank you to the Department for working with me and supporting me through a challenging time in my life. I want to thank Antonella Del Fattore Olson for her support and encouragement in my Italian language learning, without which this research wouldn't have been possible. Your love of your culture and ability to bring people together around it is unmatched. Thank you to Kirk Lynn for your care and enthusiasm across and through my different seasons as a scholar, artist, and educator. Thank you to Nic Berger, Maria Manzella, Linda and Kevin McQuaid for caring for my son while I completed this research. And to all of my friends, family, and community who have supported me emotionally through this whole process; I am so lucky to have you. Thank you.

Abstract

Mobility and Environmental Intimacy in Italian Volcanic Zones

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The University of Texas at Austin, 2019

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This thesis explores human and environmental movement and mobility in various Italian volcanic zones. Places and sites are typically thought of as stable, locatable in a specific location, pin-pointable. Places are not generally considered “mobile.” Stromboli, Italy and other volcanic sites force the ethnographer to reconcile a certain tension between movement and place. Volcanic sites are worlds that are materially and socially constituted through movement. How tectonic plates move creates volcanic activity, how lava moves up and out of the volcano transforms the landscape, and how people move to, from, around, through, up and down the volcano creates a volcanic social world. How do humans navigate this environment, and how does the environment agentially present itself as a force to be circumnavigated? Movement and mobility serve as a framework for theorizing human social relations with their environment and other non-humans. Thinking through mobility captures the unique limits and affordances that volcanic environments offer to their human, plant, and animal residents. Scholars differ on whether or not we can call a landscape “alive,” “lively,” or “vibrant.” This thesis argues that the answer to this question is based in observations about movement. That we can, in fact, locate agential capability in the way that a subject moves. The ability to move is the condition for agency.

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Chapter 1: Introduction: Why Mobility?

Why would someone want to live near an active volcano? That is the question that brought me to do ethnographic field research in several of Italy's active volcanic zones: Stromboli, Mt. Etna, Mt. Vesuvius, and the Phlegrean Fields. I was interested in exploring questions about risk and attachment to place, and what it means to live in an uncertain environment where humans have relatively little control over the environmental factors that greatly impact their lives. The choice to continue to live in an environment filled with risk seems to go against the human instinct for self-preservation. To continue living in proximity to such a place, one could argue, is irrational. A political ecological perspective has been popular to explain these types of environmental vulnerabilities (see Faas and Barrios' 2015 review article): humans would make this "choice" because their lack of power *actually* leaves them without a true choice. Their hand is forced. Such a framing of the situation would paint residents of Italian volcanic zones as victims of political vulnerability, unable to leave a risky situation because they don't have the economic and/or political power to do so. In fact, however, many living in the red zones of Mt. Vesuvius have been offered money by the government to leave so that an evacuation crisis can be avoided when the volcano erupts again, as volcano scientists predict it will. So this type of explanation lacks an accounting for the realistic possibility of the human choice to leave, and the fact that the humans who have the agency to do so decide to stay anyway.

Why does a person choose to continue living in uncertainty? What makes the risks of damage to life and property worth it? What attachments to place supersede the human drive for safety? When does desire become more powerful than fear? My research in these places revealed a strong attachment to place and landscape that supersedes any perceived risk that inhere in these volcanic environments (See Smith 2018). These sites reveal a fundamental relation between risk, agency, mobility, and intimate knowledge between humans and non-humans. Human relation to environment in these sites is characterized by a mutual mobility—moving and being moved— through which both human actors and landscape emerge as agents. To move is to present as an agential force, and to navigate is to know. Intimacies emerge through movement and navigation (see Raffles 2002). In this thesis I argue that landscapes have agency because of their mobility, and that human intimacy with landscape emerges through an acceptance of the risk that comes with navigating and moving through, around, and close to environmental hazards.

All of the above questions, as I pursued coursework with much reading in New Materialist and Ontologies theory (see Coole 2010, Barad 2010, Kohn 2015, Gordillo 2016, Pine 2016), began to present themselves through a geospatial and temporal lense—what is the *stuff* of living in one of these zones? How does the environment present itself materially, how are volcanoes not uncertain merely as a concept but as a geological force? How do people and houses and scoria and lava move in these environments in relation to one another? For me, movement and mobility became the framework to be able to theorize human social relations with their environment “beyond the human” (See Kohn 2015). How do humans navigate this environment, and how does the environment agentially present

itself as a force to be circumnavigated? I began to consider that having agency is to be able to move, and to have the power to move another. Mobility is the perfect framework to capture the unique limits and affordances that volcanic environments offer to their human, plant, and animal residents. To speak of movement inherently encompasses a relationship between time and space. For an object to be in motion, to be mobile, it must pass through space in some amount of time. (See DeCerteau 1984). Time is of utmost importance in a volcanic zone: how long has it been since the last eruption? When will it erupt again? Space is volatile; a volcano is space-in-motion. Geological features, generally taken to be fixed in space, move and shift with their own agency and constrain the moving and shifting of human actors. “Space is not disembodied abstraction, but a tangible, volumetric, textured configuration whose form is modifiable and thereby plastic (Gordillo 2016:78).”

Worlds are constituted materially through movement. Movement flattens ontologies (Latour), as both matter and people move. Volcanoes are a particularly salient place to explore this mode of theorizing and thinking through human/non-human relations. Volcanoes and the seas that they typically adhere to are more mobile landscapes than most, and affect human movement in significant ways. Like Laura Ogden’s swamps, volcanoes constitute and shape human subjects through the unique types of movement that they afford and limit. Scholars differ on whether or not we can call a landscape “alive,” “lively,” or “vibrant” (Kohn 2015, Bennett 2010). I argue that the answer to this question is based in observations about movement. That we can, in fact, locate agential capability in the way that a subject moves. The ability to move is the condition for agency. The movement of matter causing other things to move is the definition of agency.

In the summer of 2018, I spent a week each in the areas around Mt. Vesuvius, Mt. Etna, and the Campi Flegrei, and nearly two months on Stromboli, the continuously active volcanic island in the Tyrennhian Sea between Sicily and Italy’s mainland. The majority of my analysis will focus on data gathered on and about the island of Stromboli, with examples and cases from the other field sites appearing periodically to support my analysis of the Strombolian data. This will allow for a clear ethnographic picture to emerge of a specific place—the island of Stromboli—while also drawing comparisons to other sites that we would call volcanic so that we can ask if there is anything one can say about volcanoes and the movement of their residents “in general.” One interesting phenomenon that continued to emerge for me in my research was how we generalize between these vastly different geological phenomena and label all under the heading “volcano.” There are interesting analogues being made between different places in merely calling a zone “volcanic.”

These comparisons hinge on a philosophical rather than a morphological/geological observation: a volcano is a site where the human can come into contact with the geological. This thought can be further developed by thinking with some of the multi-species and/or STS literature that analyzes speciation and how that happens. Tim Choy in *Ecologies of Comparison* treats the scientific names of orchids discovered in Hong Kong, and the tricky questions that arise when determining whether or not to speciate an orchid morphologically or genetically. “Relations among and between different forms of life,” Choy reminds us, “are not simply ‘out there’ to be discovered, nor are their spatial and temporal scales self-evident. They all must be posited and established through scientific (ecological) research.”

(Choy 2011:12). Different forms of volcanism afford different types of movement around the area, yet they all must share some common features to be able to be categorized together as examples of “volcanic zones.” I argue that this analogy-making process is centered on the human. The process through which a variety of geological formations become “volcanic” depends on a categorical lumping together of incredibly diverse phenomena. Observing these would lead the anthropologist to define “volcano” as “a site in which humans come into intimate contact with gaseous, solid, and liquid material from inside the earth which, in non-volcanic sites, usually remains hidden by the earth’s crust.” These are poignant sites for observing “gaia” in action, where humans must negotiate with an earth that has its own needs and its own agency. My study looks at the way that geological formation confines and shapes human action and forms. Settlement is confined, or if not confined, then at risk, by volcanological structures. Human infrastructure must bend to nature in these settings.

Keith Basso, in his book *Wisdom Sits in Places: Landscape and Language Among the Western Apache*, explores how landscapes have the ability to “work” on people. In the case of the Apache, landscape place names with associated historical morality narratives about the ancestors form young Apaches as moral subjects within their society. In the case of volcanic environments, sites of “ruin” like Pompeii and Ercolano recall historical narratives about large eruptions. In this way, volcanic landscapes “work” on their inhabitants by inciting fear and provoking decisions not about morality, but about mobility—whether to stay or go in an environment that is “dangerous.” And like in the

Apache case, it is the physical, material features of these landscapes that force residents to reckon with these choices which form them as mobile subjects (Basso 1996).

Chapter 2: To Navigate is to Know: Intimate Knowledge of Landscapes

While recent scholarship regarding landscape has been more capacious in moving beyond a “freeze frame” definition of an environment frozen in time, there is still a heavy focus on the visual in considerations of what it means to experience a landscape. W.J.T. Mitchell, who suggests a triangulation of “space,” “place,” and “landscape” for analysis of sites of human-environment interaction, continues to focus on the landscape-as-view: “Place is a specific location, a space is a ‘practiced place,’ a site activated by movements, actions, narratives, and signs, and a landscape is that site encountered as *image* or *sight*.” (Mitchell et al, 2002. emphasis mine). I argue that volcanic landscapes require us to re-evaluate this limited conception of landscape-as-view in order to consider a subject’s multiple modes of engagement with its environment, and the apparatuses by which these engagements are made possible. I wish to suggest that the concept of landscape is incomplete without some accounting of environmental agency that goes beyond treating environmental features as a passive backdrop to human activity, as Dipesh Chakrabarty warns against in his essay “Climates of History,” or merely an object of anthropogenic change, but that a holistic perspective should guide us to a reckoning of non-human agency in accounts of landscape (Chakrabarty 2009).

This environmental agency emerges through movement; and apparent in the ways that humans must navigate this landscape’s unique features. You can’t even arrive at the island of Stromboli without thinking very seriously about mobility and getting from place to place. Modes of transportation abound to transport tourists, scientists, and locals to the

island without cars “*in mezzo al mare*,” in the middle of the sea. Islands are generally written about as the epitome of fixity, and we tend to think of places and sites as things that are stable, locatable in a specific location, pin-pointable. We don’t generally think of places as being mobile. Stromboli and other volcanic sites force the ethnographer to reconcile a certain tension between movement and place. Stromboli resists description as a place without considering the ways that it is literally moving as a landscape, and the ways that it manipulates the movement of other human and non-human subjects. Volcanic sites are full of movement and they themselves are moving.

My travel plans to arrive at the site in May of 2018 were meticulously made, especially knowing from reading TripAdvisor forums that transportation options are more limited during “off-season” months—basically, any time of the year other than July and August. After hours of research on planes, trains, and automobiles, it was arranged that I would fly into Naples on a Tuesday and go directly from the airport to the port in the Bay of Naples, where I would get on the overnight *nave* that would dock first on the island of Stromboli after an 8-hour journey, then at the other Aeolian islands in the 7-island chain, then continue on to the port of Milazzo on the north coast of Sicily. It was essential that my plane arrive on time to the Naples airport, because during off-season times, the ships only leave twice a week from the Naples harbor, so missing the boat would mean sacrificing half a week of precious research time on the island. I bought my ship ticket ahead of time, as limited options lead to full ships on the days they sail, and I also didn’t want to risk delays in the ticketing process or having to navigate the harbor to find the ticket booth causing me to miss the boat.

Of course, nothing went as planned. It just so happened on the day I was traveling there was a *sciopero*—an airline worker strike—that affected only a few Italian airports. Naples was one of them. After a two-hour delay and a 3-hour anxiety-ridden plane ride, we taxied into a rainy Naples airport right as my ship was leaving the harbor. My mind was racing the first hour of the trip, running scenarios and comparing what-if's that could possibly allow me to get to the boat in time—if I took a taxi from the airport instead of the bus, if I just booked it and ran there with my duffel bag, if the current thunderstorming weather caused delays in the boat schedule that would make my ship leave later and give me more time, if the plane went faster than scheduled and we got there earlier than predicted....there were numerous environmental uncertainties that affected my ability to make a definitive decision in the moment. My agency as a decision-maker was limited by other agents like the weather.

By the last half hour of the plane ride, I had given up on these possibilities and my focus was singular: get on the airport's WiFi as quickly as possible once we landed to find an alternate route. I remembered reading that, though the daily *aliscafi* (hydrofoils) don't leave from Naples during Fall, Winter, and Spring months, they are still available when weather allows from the Sicilian port of Milazzo. And I knew I could get a train to Milazzo, or at least to Catania, where I could take a taxi or a bus to Milazzo the next day. Later, Andrea, the proprietor of the bed and breakfast where I stayed during my first visit to Stromboli, commended me for knowing this. After having informed him about my flight delay situation from the Berlin airport, he was incredibly impressed that I made it the next day, and seemed to regard me as possessing a small bit of local knowledge. His impressed,

eyebrow-raising regard revealed that to be able to move to, from, around, and through the island is to know it. My ability to make my way to the island across planes, trains, and boats in expert time proved a level of local knowledge unexpected for a first-time visitor to the island.

On Stromboli, to navigate is to know. This is a world that is materially and socially constituted through movement. How tectonic plates move creates volcanic activity, how lava moves up and out of the volcano transforms the landscape, and how people move to, from, around, through, up and down the volcano creates a Strombolian social world. That Tuesday, I became a part of that social world. As I waited for my duffel bag to rotate around the conveyor belt, I got on the Naples Airport's WiFi network, navigated to Trenitalia's website, and purchased a ticket for the midnight train from Napoli Centrale station to Milazzo. I walked through the automatic doors to the exterior of the airport, where signs directed me to the shuttle to the train station. I boarded a bus, hauled my things, and waited. And waited, and waited. Stasis inheres in mobility. I was exhausted from traveling already and eager to get on the train where I could sleep, and this mood left me feeling in a sort of twilight zone. Stuck. Uncomfortable in a foreign place and quite literally unable to move from it because the train wasn't coming. Other trains came and went; other trains scheduled to leave later than mine as I saw delay after delay flash onto the screen. My abundance of baggage for the month-long trip also prevented me from comfortably moving from the seat I had staked out in the station. After a few hours of being frustrated by a lack of mobility, my train finally rolled into the station and sat there for a good half hour while everyone loaded.

I fell asleep in a four-person sleeper train car and woke up on a boat. The regional trains, instead of stopping at the Strait of Messina and making passengers de-board and get on a boat, apparently board the boat themselves to cross the strait. This unexpected (for me) change in modes of transportation left me disoriented and confused, and a familiar “twilight zone” feeling that had emerged in my train station waiting reappeared. I had been tracking our train’s progress on my GPS app to make sure I didn’t miss my stop, and had a feeling of “well, that can’t be right” when I saw that the train’s position was determinedly over the water. A step outside of the train car assured me that my GPS was correct—the train had boarded a large cargo ship. I stood on the deck in the dark of the early morning and watched Calabria disappear behind us. A taxi to the port of Milazzo from the train station and a ferry through the Aeolian Islands later, I found myself standing on Stromboli, the world’s most continuously active volcanic island, at the convergence of the movement of the African and European tectonic zones. My own journey to this field site parallels the challenges that many scientists, residents, and tourists face as they attempt to draw close to and navigate the volcanic island environment of Stromboli. In the following sections of this paper, I detail specific features of Stromboli’s landscape and geography that require sustained, habitual human engagement for intimate knowledge to emerge between human and non-human actors.

Chapter 3: Volcano as Landscape-in-Motion

Stromboli is one of seven islands in the Aeolian Arc, which includes (from west to east in the Tyrrhenian Sea) Alicudi, Filicudi, Salina, Lipari, Vulcano, Panarea, and Stromboli. Of the seven, Lipari, Vulcano and Stromboli are considered still active and Panarea potentially still active. Alicudi, Filicudi, and Salina ceased volcanic activity between 10,000 and 30,000 years ago. Lipari and Vulcano display different types of volcanism than Stromboli does. While Stromboli's cone erupts and explodes with lava multiple times per day, smoking fumaroles of volcanic gas are more typical of the activity on Vulcano and Lipari. Tourists are attracted to Vulcano for the geothermal mud baths present because of this type of activity. There are also six submarine volcanoes in the tectonic zone in the Tyrrhenian Sea: Glauco, Sisifo (the oldest of the six at 1.3 million years old), Enarete, Eolo, Lametini, and Alcione. These emerged because, in a phenomenon known as "Southern Tyrrhenian spreading," the earth's crust thinned and allowed magma to rise to the surface.

I spent a lot of time interviewing volcanologists and volcanology students at the small volcanology "museum" on Stromboli run by the Istituto Nazionale Geofisica e Vulcanologia (National Institute of Geology and Volcanology, referred to henceforth as the INGV) in order to learn more about the particular risks posed by this unique volcanic object and how governmental organizations communicate risk to the public. The INGV is the scientific branch of the *Protezione Civile* (Civil Protection), providing the government organization with the volcanological research insights that they need in order to make

informed decisions about communicating with the public regarding geological risks. Fausto, one of the supervisors at the volcano museum on Stromboli and an INGV volcanologist who works specifically on the chemical makeup of the lava and gasses at volcanic sites, spent many an afternoon answering all of my questions on Stromboli's volcanic history with animated enthusiasm. It is estimated, he explained to me that the surface of the island of Stromboli is only one quarter of the size of the undersea base of the entire volcano. The surface part, however, is much more well-known and studied because undersea research can be time-consuming and costly. The goal with volcanological research is to gather data to a precision of 2 meters. For the subaerial (above the water) part of the Stromboli structure, this data acquisition only took a few months. Fausto estimated it would take 5-10 years to gather data to this precision for the submarine environment.

There was some difficulty in my project in determining what, exactly, constitutes Stromboli as a site. Is it the "island," ending at the coast line? The volcano, descending all the way to the sea floor? Does it include vast geological space to encompass the movement of large tectonic plates that caused the volcano to emerge as an object in the first place? Stromboli troubles ideas of what it means to study a "site." I argue that we are in fact, talking about a constellation of specific locations, intersections through which Stromboli emerges as a site. These include the specific geography of this situated place, but also extend culturally to Melbourne, Australia, where there is a large population of displaced Strombolians; and geologically to Africa and Eurasia, where the tectonic plates merge to create the Strombolian volcanic activity; and comparatively to Iceland, Hawaii, Indonesia, the Philippines, Alaska, Japan, and Central America, where other volcanoes of its type

invite the human observer to make associations and comparisons, filtering the experience of this landscape through ideas and data about what other “volcanoes” do. Gaston Gordillo suggests in *Rubble* that “the defining quality of places is that they gather, attracting people, memories, and affects around them. Places are nodes rather than containers. They entangle other nodes.” (Gordillo 2016:21)

The term “island” is also problematic for trying to categorize this place, as the term suggests a mass of land that ends abruptly at the coastline. Stefan Helmreich, Philip Steinberg, Stuart McLean, and others remind us that water and land must stop being treated as binary oppositions, as the ocean, too is a social site (Helmreich 2016; McLean 2011; Steinberg 2001). Undersea phenomena are just as much a part of the sociality of the island, particularly as they contribute to Stromboli’s traditional fishing economy. Weather at sea affects mobility and the ability to arrive at the island or leave it. And tectonic activity and movement hundreds of miles away from this “place” manifests in hourly volcanic eruptions.

In many of my volcano-centered conversations, mention was made of the Marsili submarine volcano, the largest one whose eruption could easily put all of Sicily underwater. I asked similar questions about how much research had been done on this volcano, did scientists have an accurate picture of what it looked like, was it being monitored at all? Fausto and the two young female students who were interning that week passionately discussed Marsili with me during one of the afternoon periods where the Center was empty of visitors. The main issue with Marsili, they explained to me, was *why* to do this expensive research.

“With Stromboli, you need maximum precision because people live here, they climb on top. There is some information from satellite and GPS data, and with new sensors you can get a *little* bit on the underwater volcanoes, but error is very high. There is a factor of 10 between subaerial and submarine cost of investigation—what costs 1 euro above water costs 10 euros underwater.”

So, the expense of doing research above the surface of the water on a volcano like Stromboli is justified: human lives could be at stake, so warning about potential volcanic risks is crucial. Underwater volcanoes, however, don't present day-to-day risks or interactions with human populations. Scientific research emerges at the site of human interaction with the object of study, and therefore the undersea volcanos' remoteness from everyday human experience they fail to emerge as valid objects of scientific study in the same way that Stromboli does. There is some talk that there are prospectors interested in trying to mine Marsili for geothermal energy, which could be a strong enough “why” for investment in further research, but for now cost is prohibitive to investigating the volcano because it does not pose any immediate direct threat to human life or property. The importance of a volcano as an object of scientific study emerges from its perceived intimacy with human subjects. The volcanoes most known about and most studied are those whose intimate connections with human life shape them as potentially risky environments. The idea of “risk” is centered on the human. No matter how potentially destructive a volcanic site may present to other forms of life or landscape, it is only considered risky

enough to merit intense scientific attention if human life and property is threatened. In her book *Masters of Uncertainty*, Phaedra Daipha points out that, for meteorologists, “the ultimate objective is always to adjudicate on the social consequences of the atmosphere. Atmospheric dynamics, after all, are articulated as ‘the weather’ only to the extent that they are considered socially salient...any prediction about the weather is also a commentary on its social ramifications” (Daipha 2015:102).

For volcano scientists studying these areas, the same thing is true: not only are any warnings or predictions about a volcanic eruption going to be made only in the case of social implications, but in many cases, the data will not even be available for a prediction to be made if a particular volcano is not considered a social threat. Human-volcano interactions shape volcanology. As a volcano’s proximity to human life and potential to threaten it increases, so does its importance as an object of volcanological study. Therefore the quality and amount of available data on any given volcano is directly related to its relationship to human life and property. Daipha notes that what will “‘count’ as weather” depends on a relationship to predicted consequences of atmospheric conditions for humans. In the same way, we might say that what ‘counts’ as a volcano, or, at least what ‘counts’ as a volcano scientifically—or what is given attention and funding by the volcanological community and funding—(Hartigan 2017) in a socio-volcanological economy depends on a set of geological conditions having a specific type of relationship to human beings. There are volcanoes that are well-studied that don’t typically pose a large or frequent threat to human life, but scientific justification for doing so is often based on rationale that study of a particular volcano will help scientists better understand those that *do* pose a threat. Lisa

Messeri discusses a similar phenomenon in how planetary scientists make comparisons between other planets, and landscapes on earth that are seen to be analogous. The study of Mars is justified and seen as important by merit of its comparability to Earth environments, and therefore its bearing on human life:

“Mars is really more Earth-like than anything else in our solar system...One thing I’ve often thought is that if we can understand better the process by which Mars went from that environment with water and probably some atmosphere to where it is today, it would help us to better appreciate the Earth’s atmosphere and climate. And so studying Mars suddenly has a relevance to studying our own planet.”-one of Messeri’s scientist informants (Messeri 2016:109).

The Stromboli volcano, similarly, becomes an analog and site of research by virtue of its potential comparison to other, more hazardous volcanic sites. The Stromboli volcano does not frequently pose a threat to human life because of its relatively mild eruptions and infrequent occurrence of phenomena such as lava flows, but there is a lot of language in studies of Stromboli that praise this particular volcano as a great workshop for learning about volcanoes “in general” since its more frequent eruptions allow for a greater comparative data set. And to the extent to which this data set can be generalized, it can allow scientists a greater understanding of those volcanoes whose eruptions would be more potentially devastating to human life. Lisa Messeri writes in *Placing Outer Space* about the history and development of the field of exoplanetary astrophysics, showing that human

attention—and in this case, what captures the human imagination—is essential to constituting any scientific object of study (Messerli 2016:6).

There is an undersea fault that links Stromboli and neighboring Panarea, and undersea acoustic data could prove a potential link between the activity of the two volcanoes. There is a submarine continuous monitoring system underneath Panarea with acoustic sensors that measure frequency and intensity of the sound bubbles emitting from the Panarea submarine volcanism. In November 2002, months before the devastating 2002-2003 eruption of Stromboli, an increase in frequency of the acoustic signal showed proof that the systems are connected. It has been difficult for scientists to prove this claim because data during this time was acquired, but not transmitted in real time. This poses the risk of data loss. There are routine maintenance checks to the equipment, but if you go after weeks and something went wrong, you might have lost a lot of data. So, a regularity in this pattern has not reliably been established, but there is a strong suggestion that the two are linked and that further knowledge of the relationship could provide more accurate predictive measures.

Stromboli also affords an analysis of the “negative landscape”: what could be there, but isn’t. The lack of electric light in Stromboli as part of the landscape is only noticeable in comparison to other, more “modern” landscapes in the viewer’s mind. But in this way, a lack becomes a positive feature. For a long time the island was talked about as “quaint” and “backwards” because of its lack of modern conveniences. Ginostra, the village on the western side of the volcano, was only connected to electricity in 2004. Many of the tourist websites that I perused before making my visit advised travelers to bring flashlights, as

there were no electric street lamps in the village. Many of the local people complained about tourist hikers traipsing through the village late at night with their headlamps, blinding local people who are used to walking or riding a scooter through the streets of town at night. Roberto Rossellini's 1950 neorealistic film *Stromboli* featured Ingrid Bergman, playing a Lithuanian widow in a war camp, who marries a man from Stromboli and is horrified at the island they arrive on. How "small-minded" the people are, "savages." The women live very separate social lives from the men, and roles are strictly defined. This social "backwardness" is paralleled by a lack of practical advancement into modernity. Even today, Stromboli as the most remote of the Aeolian Islands (furthest from Milazzo, which is the locally preferred port) lacks some of the modern conveniences that are available on the larger, comparatively more metropolitan islands like Salina and Lipari. There is only one ATM on the island, which sometimes runs out of cash during the winter months when boats don't make it around to restock. Groceries are scarce on the shelves during the winter as well.

Gaston Gordillo (2016:31), writes about certain "haunted" sites of rubble in the Argentinian Chaco that what is not there, the absence of a building that was formerly, historically present, creates an affect by its absence "that exerts a hard-to-articulate, nondiscursive, yet positive pressure on the body, thereby turning such absence into a physical presence that is felt and that thereby affects." In the case of the lack of electric lighting on Stromboli, the body's physical adjustment to this negative feature of the landscape is quite visceral. I experienced an actual, physical sensation of my eyes adjusting to seeing by the light of the moon and the stars. My other senses became more attuned to

the landscape around me, with touch and sound alerting me to the proximity of people or buildings. A change in the specific texture of the sound of my feet hitting the ground signaled a change in terrain. Landscape can truly affect, shape, and form the human body. Body and landscape react to one another in an unending evolutionary dance. Laura Ogden writes about how the southern Florida Everglades produce a certain kind of hunter body—one that is like an alligator. Just as the Everglades turn humans into hunters and the landscape becomes a hunter’s landscape, so does the uniqueness of Stromboli’s landscape attune specific human bodies to its intimate navigation (Ogden 2011).

Or, explored from another perspective, we could say the landscape is broadened by a comparative understanding of other landscapes. Human perception is always already conditioned by landscapes that have been seen in the past. As Eyal Weizman says about interpreting testimonial evidence, “testimony can’t be interpreted only for what’s there, but also for what’s not there--what is missing, distorted, or obscured...what blurs and masks part of the evidence reveals something else” (Weizman 2017). We know something about what’s there by a comparative analysis, understanding what is not there that *is* somewhere else. Landscape is activated by these comparisons to other places that are categorized as “volcanic,” also always a comparative move. Strombolian activity is incredibly different from the volcanic activity of the Phlegrean Fields, which is different from Vesuvian or Etnean activity, which are all different processes from those deemed “volcanic” in other places, yet scientific understanding has united these diverse phenomenon under the comparative category of “volcano.” Strombolian volcanic activity is characterized by frequent and constant small expulsions of lava bursts and scoria, rarely producing lasting

change to the landscape or threatening human life or property. While activity is consistent, it can be very difficult to predict when a larger eruptive event might take place because the magma is consistently higher up in the volcano's chamber. Activity in Mt. Etna and Vesuvius is characterized by less-frequent, dramatic and sometimes devastating ash expulsions and lava flows, with Etna erupting with far more frequency than Vesuvius in recent memory. The Phlegrean Fields area is what is known as a supervolcano, and doesn't "erupt" in the sense the other volcanoes do or produce lava at all, but constantly emits sulfurous gas from fumaroles throughout the site. The ground in this area is unstable and prone to collapse due to the thinness of the earth's crust. Driving through the city of Pozzuoli in a taxi, the smell of sulfur passes in and out of the car windows in waves, like hitting the occasional olfactory pot hole. In fact, the name of the town "Pozzuoli" comes from the Neopolitanization of the Italian word *puzzo*—"stink."

Thus, "Italy's volcanoes" emerge as a site and as a place through scientific measurement and understanding. Lisa Messeri points out that imagination is key to the process of placemaking. Tourists imagine what could or could not be in a space, compare it against what is actually there, and this comparative act constitutes the place. "Places on earth can be cities or villages, landmarks or landscapes. They have a specific character that might change over time or be differently perceived from person to person. But importantly, one can be or imagine being in a place" (Messeri 2016:2). Fausto, one of the INGV scientists with whom I did extensive interviews about Stromboli's volcanology, told me that the INGV had wanted to put an information center similar to the Stromboli one at Ischia, which is also a volcanic site that is potentially active. But the tourism bureau of that

particular place ruled against it, saying that they didn't want tourists to imagine Ischia as a dangerous site and be afraid to come there and vacation. Ischia, as a place in the imagination of the potential tourist, is a place for a week of beachside relaxing. To highlight the risks by erecting a volcanology center would go against popular perception of what the place is and how much risk traveling there carries for the tourist.

The volcanoes and other tectonic and environmental features of my sites emerge as players that orchestrate sociality for humans and other non-human actors. These material realities force mobility, provide resources, encourage certain economic activities and discourage others. They claim and threaten (either realistically or anxiously) human life and property. They shape the landscape and what can and can't be built there. They shape cuisine choices by providing soil nutrients for certain types of cultivars like grapes, citrus, and capers. They attract adventure and outdoor tourists who want to see an active volcano up close. This in turn necessitates other touristic facilities--hotels, restaurants, bars, hiking shops, souvenir stores. All of this is created by virtue of the materiality of a specific configuration of geological features and their cultural and symbolic associations. A site invites these material consequences when it is located at the nexus of tectonic plates. Different volcanic activity produces different engagements with it and different temporal fluctuations/manifestations of temporality/relationships with time/social temporalities.

In volcanic zones, time is made material through environmental indices. "Look down there," Sergio told me, pointing to the Tempio di Serapide ruins near the main square in Pozzuoli from the rooftop where we stood. "When I was a boy, that was all underwater. Maybe until seven or eight years ago." The town of Pozzuoli is located to the west of

Naples, further down the coast, and is the closest town to the Campi Flegrei volcanic fields. The particular type of volcanism displayed in this area, called *bradisismo* (bradyseism), causes the earth's crust to rapidly increase and decrease in height above sea level as volcanic gases expand and contract under the earth. Most of the architecture in the area has withstood these fluctuations admirably, but there is one *quartiere* close to the center, Rione Terra, that is currently unoccupied. It was evacuated fully during a particularly strong volcanic event, as one of my informants who grew up in the area told me. As a girl, her family was forced to move to a different Pozzuoli neighborhood and were not able to return.

The material traces of these fluctuations in the earth's crust paint a timeline of human-earth interactions. Caves once believed to be dwellings in the Tempio di Serapide area were discovered to be port or docking areas for boats. These serve as visual reminders of the past, a material eruptive history, evidence in space of passing time. The sea once lived here and now it has moved. It may move again. The population in these areas have adjusted to social relations with and within a dynamic environment where possibilities for built infrastructure are limited and constrained by shifting environmental factors.

Botanical growth and regrowth on the slopes of Mt. Etna outside of Catania serve this same purpose. As you approach the base of the mountain, you see pine trees, brush, and flowers. The higher you get in elevation, the less diverse the plant life becomes as you reach the more recent lava flows. Lava is hot enough to kill all life, so even the simplest growing life forms are destroyed in a lava flow. Over time, the solidified lava begins to break down from contact with oxygen and the simplest plant life form, lichens, begin to grow back. This can take up to five years, so the beginning of lichen growth in an area

indexes the occurrence of a lava flow in that area 2-5 years prior. The blossoming of flowers indicates a 5-10 year recovery period, brush and small pines 15-20, tall pines longer. Botanical colors and textures multiply the lower you circle down the mountain, while the Rifugio points display mostly lichen-splattered rocks, and, even higher up toward the summit, black and brown solidified lava is absent of any plant growth. This conic gradient of the landscape is a visual indicator of time passed since the eruption, and possibly a subliminal or subconscious signal of safety. If you are in the pine trees, the lava can't reach you there, one may be tempted to believe. Historical eruptions, however, have proven this wrong as they've coursed lava all the way to the coast twenty miles away. New towns have even been created along the coast line by solidified lava from eruptions.

Plant life is typically considered to be stable, immobile, grounded, but these botanical mobilities force us to consider plants as a vital part of a landscape-in-motion, and life forms with an agency of their own. They gain agency through mobility; they shape a landscape through their ability to move across it and form its colors, textures, and productivity or lack thereof. When lava moves, plant life moves both against and with it. And what plants end up growing shape the region's cultural identity—the aesthetics of the landscape, the flavor of the food that is produced through the agency of the plants that thrive in those particular volcanic soils: citrus and capers are important to Sicilian regional cuisine. Malvasia grapes have also proven an important staple of the area's culinary history, and one that highlights this phenomenon of plant mobility and its importance and agency in shaping a cultural landscape. Lorenzo, one of the local Strombolian hiking guides, pointed out some fields as we ascended the volcano one afternoon with a tour group. The

fields had at one point belonged to his family, and had been purposed for cultivating malvasia vines. Stromboli in the 1400s became a crucial site for wine production because the phylloxera epidemic that plagued the European mainland, wiping out the majority of grape crops from France and Spain to Greece and Italy, couldn't reach the island. The remoteness of Stromboli and the difficulties to cross the Tyrennhian Sea detailed in my introduction quite literally immobilized the wine blight. Lack of movement is lack of life; the microbial immobilities of the wine blight which killed phylloxera allowed for malvasia grapes to continue to thrive, alive, on Stromboli. Malvasia wine then moved through shipping and exporting, giving life to the Strombolian malvasia export market. These mobilities and immobilities related to nonhuman life shape the island as both a physical and cultural landscape.

As Shannon Lee Dawdy discusses in her book *Patina: A Profane Archaeology*, there are material clues through which particularly experts can read volcanic history (Dawdy 2016). We can speak, with Gaston Gordillo following Walter Benjamin, of the volcano's life and the afterlife of each eruption (Gordillo 2016:20). It is important to remember the the materiality of objects is not reducible to what humans make of them (2016:14). "Topographies of forgetting...memorials conceal the past as much as they cause us to remember" (2016:192). Part of the job of a memorial is to erase the existence of an event. Solidified lava appears in these zones as a sort of living memorial of an eruptive event, which may conceal or change or shift the landscape as it had appeared before. Which forces the anthropologist to consider which site it is that we are dealing with—the landscape as it was before the eruption? During? After? I find Gordillo's discussion of

space to be useful, as not an abstraction or a lack, but as a “tangible, volumetric textured configuration whose form is modifiable and thereby plastic” (2016:78).

Time scale is an important consideration when viewing the geological history of the area as well. Deep history is a much more important consideration in volcanic zones than in less volatile environments, because the way the volcano was formed and its long-duree eruptive history can provide clues about present-day geological behavior. The collision of tectonic plates and how and when that occurred dictates what type of volcanism the people who live in an area will have to navigate. When two continental plates collide, as Fausto explained to me, you get mountains. Instead, when a continental plate collides with an oceanic crust, the oceanic crust is cooler and denser, so goes down, creating the pocket for lava to come through.

From a panel in the Centro INGV:

“The reconstruction of the island’s geological history provides the following distinction:

1) PALEOSTROMBOLI

from 100.000-35.000 years ago

2) VANCORI

from 26.000-13.000 years ago

3) NEOSTROMBOLI

from 13.000-5.000 years ago

4) RECENT & PRESENT STROMBOLI

from 5.000 years ago to today”

These ideas about time are represented visually as well. One of the first panels you see when you walk into the small Center features a detailed and colorful aerial view of the island. The colors on the geological map are a visual, flattened representation of geologic time and the geological time scale of Stromboli. Each color represents a different eruption, a different time, a different moment in the life of the volcano.

Thus, Stromboli challenges ideas of landscape being a “static” category by emerging as a picture of temporality, where constant day-to-day change and historical change-over-time emerge as an important part of the landscape as such. These changes are agential both in reality and from a human, culturally-constructed perspective as scientific learning and remembering shapes human relationships to the volcanic environment through figures, graphs, charts, and images of how Stromboli has changed and is changing.

Chapter 4: Science on the Move: Measuring Risk in a Landscape

The scientific study of Stromboli is an important feature of the human, physical, and imaginary landscape. The way that science moves and circulates through the island constitutes the volcano as a site of scientific significance, which forms and shapes how it is imagined as a landscape. From the village of Stromboli, one of the most prominent architectural features when you look up towards the top of the volcano is the Pantheon-esque structure that houses the offices of the *Protezione Civile*—Civil Protection. The building is studded with numerous instruments and satellites used to measure various indices that volcanic movement and activity could be increasing. Seismographs measure the earth's movement, detecting subtle tremors that might indicate movement of tectonic plates that will lead to increased volcanic activity. Standing on one of Stromboli's beaches and looking out into the sea surrounding the island, besides the yachts and fishing boats that anchor fifty yards out from the shore, the observer also notices buoys that constantly monitor the sea level. A drastic change in sea level could suggest that there is immanent threat of a tsunami. Those who hike to the top of the volcano see it emerge even more as a scientific object, as sensors, monitors, and thermocameras ring the craters at the top. I spoke with some of the scientists who placed some of this instrumentation, and they told me about the difficulties that presented in getting the calibrations right up at the top of the mountain where movement is limited by the steep grade of the volcano and there is only manpower to carry all of the equipment to the top.

These thermocamera images then extend the reach of the volcano's risk imaginary to the village of Stromboli. In the dark of the streetlamp-less night, if you walk along the *lungomare* coastal road past the port, leaving the port bars and the sounds of ship horns behind you, navigating in this way, you'd be startled by an electric glow coming from outside the INGV tourist center. There's a tv screen showing live footage from the thermal video camera recording the explosions at the summit. The volcanologists for the INGV use infrared thermal cameras to constantly monitor the explosions at the summit of the Stromboli volcano. During the day, you can't see the explosions from the perspective of the village, thus they would not traditionally be considered part of the phenomenological landscape because of their imperceptibility to the situated human eye. However, livestream video footage projected in the INGV tourist center makes any volcanic eruption viewable in "real time," effectively extending the range of "landscape" to include summit activity.

One night on my way back to my room from dinner at the port area, I saw the back of my friend Maria, one of the geology graduate students who volunteered for a week-long shift at the Center, gathered with a man and his son in front of the screen. "Ecco! Wow!" they exclaimed as a particularly large explosion was evidenced by yellow and orange bursts filling the screen. The explosions aren't visible from the village, as it sits on the east side of the island and the craters are on the northwest side of the cone. Thus, under the classic definition, volcanic eruptions would not be considered part of the landscape of the village, as they are not visible in a panoramic view from any situated human position in this area. However, the technology of the thermocamera effectively extends the gaze of the villagers

to the summit, bringing this environmental phenomenon into phenomenological range for observers who remain down in the village during the nightly guided hikes to the summit.

The two men who stood talking with Maria shared an affective connection in this moment with their mother/wife who was hiking up the volcano to see the eruptions. Inside the small mobile building unit, volcanologists attract visitors' attention to the tv screen whenever the colors begin changing, signifying a shift in temperature and an impending Strombolian explosion at the summit. At times, we would see family members of hikers who didn't want to complete the summit hike themselves. In this way, the technology of the thermocamera collapses space-time in the landscape to make INGV center visitors co-present with hikers experiencing explosions from the summit.

This technology extends not only the visual field of the viewers in space, but the capacity of the eyes, the bodies, to perceive differences in magma temperature that are not apprehended by the naked human eye. Infrared cameras allow the human viewer to take in visually what falls outside of the visual light spectrum. Therefore landscape is expanded not only spatially by bringing a phenomenon into the viewer's visual field, but also optically by making infrared wavelengths and invisible (to the human eye) phenomena visible.

Lava moves through technology, and so, therefore, does the perception of its risk. Landscape is not immediate, but mediated. It is mediated through scientific representations of risk, through this screen in the village that gets referenced to understand what the volcano is up to. Landscape encompasses things that can't be seen, the representations of movements that are going to assist in producing risk calculations. In Eyal Weizman's

Forensic Architecture, he describes sensing in the following manner: “No matter if you are a building, a territory, a photograph, a pixel, or a person, to sense is to be imprinted by the world around you, to internalize its force fields, and to transform” (pg 129). He uses this description to open up the possibility of being able to understand buildings as having the ability to sense. In my field site, buildings do sense—homes, hotels, cabins, and roads burn, they crumble under the weight of scoria and trees felled by lava flows. The destruction wrought by volcanic eruptions evident in infrastructure damage can be a forensic measure of lava speed and direction. The territory around Mt. Etna has sensed eruptive activity, transforming the landscape and shifting populations after major eruptions.

Science often takes place in a lab where scientists have a certain degree of control and agency over causal forces and environmental factors in an experiment. This is why we talk about “controls” in a scientific experiment. Phaedra Daipha writes that meteorologists “improvise for themselves a liminal epistemic space between the laboratory and the field, between the high-tech environment of the forecast office and the weather in the wild” (2015:109). Volcanologists, however, are forced into motion by their object of study. An environment with its own undeniable agency and unpredictable movement patterns constrains those in relationship to it both in time and space in response to long-duree geological processes. In the lab, bacteria move in response to the scientist’s probe, microbes move in response to chemicals. In the field, scientists and their extensions—scientific instruments—move in response or reaction to whatever is taking place. The process can’t be controlled, so, in an important sense, the scientific method can’t be

followed to the letter. The scientist is not an actor, but a re-actor. An experiment can't be repeated because the conditions are constantly shifting. We don't encounter the same mountain from one day to the next. So also, in a sense, the experiment itself is a moving target. It is real, it is something that can't be pinned down as a bug in an entomology display. Volcanoes force scientists to reckon with what Eyal Weizman would call "field causality", where some of the causal elements are out of temporal focus and therefore beyond the threshold of detectability (Weizman 2017). How does one who is trying to determine the future and regain agency within the environment *move* in these uncertain circumstances? I found that scientists and local people in the village essentially are involved in different movement-mapping projects.

There are four alert levels set by the Protezione Civile: *verde* (green), *giallo* (yellow), *arancione* (orange, but the suffix *-one* provides emphasis suggesting "big" orange), and *rosso* (red). I asked Fausto, who served as the supervisor for the graduate student volunteers at the center the first week that I was there, how often the higher alerts get raised, and he told me that in the last year (2017), the red alert had not been used at all and the orange alert had been raised twice. During a red alert (typically raised when an eruptive event has *already* occurred), climbing the volcano is not advised. "*Non si sale,*" Faust told me. You don't go up. During an orange alert, usually raised when data suggest that there is a strong possibility of heightened volcanic activity, guided groups can still go up the volcano, but the guides lead the hikers up to the top and then straight back down ("*Si, puo salire, ma non si resta alla cima—su e giu*"). The two strongest indicators that a larger eruption may occur soon are: 1) a deformation (either inflation or deflation) of the

volcanic edifice, and/or 2) a change in the chemistry of the volcano's plume. Sensors measure the chemical ratio of CO₂ to other gases emitted from the craters in order to detect a potential chemical shift, and there are also monitors on the summit that are sensitive to changes in terrain level and can indicate a shift in the edifice's structure. The alert level may be raised if either of these instruments detects significant changes.

The Protezione Civile is careful, Fausto tells me, about not raising the alert too often, as it could start to be seen as “crying wolf” if there were too many false alarms, and the public would cease to take the alerts seriously. Remaining at the top to watch the explosions when the volcano is particularly active could prove dangerous or deadly when the volcanic activity is heightened. Groups typically hike to the *pizzo* (the summit), which is located approximately 50 meters above the active craters. When the volcano displays normal levels of activity, the summit area provides a perfectly safe spot for a birds-eye view of the craters as they smoke, fume, and burst lava. But when the gas and lava are under more pressure, the lava explosions and flying *scoria* (lava rocks) can reach greater height and pose a risk to hikers at the *pizzo*. This was described to me by a few different volcanologists using the analogy of a bottle of champagne—the bubbles trapped inside are like the gas trapped inside a volcano. Just as a decrease in pressure by removing the cork can cause the champagne foam to fizz out and over, a decrease in atmospheric pressure releases gas in the magma.

Though there are sensors in place that monitor important aspects of the volcano's activity, groups of scientists from the INGV still periodically come to Stromboli to take measurements, because, as Fausto tells me, the specific calibration of each of the

monitoring instruments is based on human scientific research and measurements. He said that the *product* is the research, while the *production* (the monitoring equipment) is based on the needs of the product. So the monitoring stations are insufficient for the work that needs to be done. Furthermore, larger eruptions and strong winds can sometimes damage or even destroy the monitoring instruments, requiring volcanologist technicians to come out and maintain the equipment so that it functions properly. Phaedra Daipha writes about this challenge for meteorologists.

“Every technology design carries with it a particular script for its use, inscribed in the very logics of its mechanics (Akrich 1992)...managers often come to expect that by enforcing a particular technology, they have in effect configured its use and its users (cf Woolgar 1991). Despite their obdurate material presence, however, and no matter how thoroughly inscribed with the interests of their designers they may be, technologies remain interpretively flexible (Pinch and Bijker 1987). Just as users cannot unilaterally decide what a given machine is good for, so, too, are machines unable to predetermine how they are going to be coopted by a given user. Rather, the process of technology adoption and use is one of mutual shaping and reshaping. To use Andrew Pickering’s (1995) evocative term, it entails a *tuning* of people and instruments, a recursive iteration of resistance and accommodation by the end of which the heterogeneous set of actors will have been reconfigured into a workable alignment.”

Given that Stromboli is the longest continuously-erupting volcano in the world, it is also the one that has been the most studied, and therefore assumed by many to be the most “predictable.” Fausto reminds all of the guests that come in the Center that this is a natural phenomenon and that the scientists are limited and cannot always provide a complete scenario. An English-speaking tourist once asked “Could Stromboli surprise you?” Fausto’s reply was, “It would be possible. We are studying Stromboli in detail since 2002-2003, which in the lifetime of the volcano is nothing. Do we know 60% in that time, or do we know 99% and what we are missing is negligible? I don’t know.”

2002-2003 was the year of the most devastating volcanic event on Stromboli in recent history. There was a large tsunami that destroyed many buildings along the coast and forced evacuation of the entire island. For months, the island was empty except for a small team of volcanologists who came to study Stromboli in the tsunami’s aftermath. Fausto was one of those scientists. My friend Andrea, who owns a small bed and breakfast, also was on the island during that time to host the INGV team. He comes to Stromboli for the peace and quiet, but told me that during that time, it was almost too quiet. The place was as apocalyptic and desolate as the portrait that’s painted of the island by films and popular culture, the deserted Stromboli of Ingrid Bergman’s famous film. Since my ethnographic visit to Stromboli and during the writing of this report, there was another particularly strong eruption on July 3rd, 2019, the likes of which had not been experienced since 2007. A huge ash cloud exploded 100 meters into the air, and a hiker was killed. The islanders were forced to evacuate, and lava flows began to threaten the village of Ginostra on the Western side of the island.

When I asked Rosa, one of the graduate students doing an internship in the Centro, about risks and hazards of Stromboli, she said she agrees—that there is a panel missing from the museum information about the volcanic risks. Risk varies from volcano to volcano depending on the characteristics of the expected eruption (explosivity and energy) and on number of buildings and people within the hazardous zones. Vesuvius, for example, is much more important to monitor and understand because of the “*migliaia di persone*” (there are actually not just one million people, but between 3 and 4 million) that live in the hazard zone of that volcano. Though the risks are lower for a volcano like Stromboli, “It is much more difficult to forecast a powerful explosion in an open-conduit, permanently active volcano like Stromboli, where the magma is permanently high up in the conduit, near the surface. The most violent volcanic explosions, those that pose a danger to visitors, should be likely preceded by an increase in gas pressure in the upper portion of the feeding system. But it is difficult to recognize this pressure build-up [in Stromboli] and the problem is currently under study.”

Volcanologists are in the process of trying to calculate risk through detection of movement, and the way that locals feel about risk is very different. Local, citizen perception of risk then gets materialized as movement, as whether people decide to stay or go from the island, to hike up the volcano or not, to take a boat to the mainland or not when there’s a risk of being immobilized: unable to return home.

I want to conclude this section with an ethnographic anecdote about the Phlegrean Fields that makes risk a question of material mobility. The Campi Flegrei are volcanic fields to the west of the city of Naples, located on a privately owned campsite. There are

cabins for rent and a swimming pool, along with designated places on the property where you can pitch tents. Hiking, picnicking, and visits to the crater lake are among the activities that families, friend groups, and college students engage in during a stay at the site. Throughout the property, there are numerous smoking volcanic fumaroles that constantly expel streams of sulfuric gas. These areas are roped off, as are other areas of the property where the particular thinness of the earth's crust presents a potential hazard to hikers. In these spots, a wrong step could cause the earth beneath you to collapse. When I attempted to visit the site when I was in Italy for my field research, it was closed to the public until further notice because a young boy and his parents had died falling into one of the craters. I mention this because in the months following that event, a debate ensued among onlookers about whether or not the boy had crossed the safety ropes that are meant to designate hazardous areas. Had he crossed into an area that had been designated by the park as "unsafe"? Or had he remained in the "safe" zone and been at risk anyway? Was the accident the fault of the boy's carelessness, or the park's? The park closed in order to reassess the placement of ropes, and whether the current "safe zones" were, in fact, safe. Park owners, scientists, and civil protection officials worked together to determine how to guide visitor's movement through space in the park. To move one way is safe, another is not. Relative risk of certain areas of the park is measured by the movement of ropes and where they allow visitors to move.

All of these cases make it apparent that risk in environments is a question of mobility. How lava and tectonic plates and sulfuric gas and unstable earth *move* is what causes relative risk to human lives and property in proximity of volcanoes. And how

humans respond to this risk by moving around and through these environments shows the degree of trust they display in the volcano: a measure of how they conceptualize the threats the environment presents (see Li et al 2019). The decision to move close to an environmental feature and increase intimacy can reveal a lack of perceived risk; or, conversely, a knowledge of risk coupled with an intimate trust in the agential care of one's surroundings.

Chapter 5: The Island Without Cars: Transportation's Affordances

Part of the charm of Stromboli for the Italian tourist lies in its nostalgia. Besides the absence of electric lighting that I discussed previously, there is another conspicuous lack in Stromboli's narrow, cobbled streets: there are no cars. In the neighboring village of Ginostra, there are a few donkeys that are available to help haul tourists' luggage from the ferry to their lodging but the steep grade of the hills makes it impossible for even a motorcycle to traverse. In the village of Stromboli, there are options for vehicular transportation, but ones that I argue still provide a much different experience for the driver and/or rider than riding in a car does. Personal mobility happens very differently here than in places that have cars. The nature of day-to-day moving through life on the island of Stromboli provides a high degree of intimate contact with a traveler's surroundings that a person driving or riding in a car does not experience. And it is because of the unique nature of the geography of this place that humans *must* move differently through their surroundings. Stromboli's geography is an agential force because of the ways that it constrains human choices about personal mobility; it makes humans move in a certain way; it demands that humans move through it with more intimate knowledge of its terrain.

There are a few different vehicle options for locals and tourists on Stromboli who choose, for whatever reason, not to walk. Golf cart "taxis" are available to take tourists from end to end of the island (the main street stretches about a mile from the port on the southeast side of the island to the footpath leading to the volcano's summit craters on the northeast side). Many business owners have small trucks about the size of a golf cart that

they call “*moto ape*” that can be used to haul supplies. One bar owner would drive his *ape* to bring glassware and linens for special events from the bar in the town square to the *discoteca* near the port that his family also owned. I also saw construction workers using them to haul cans of paint from the hardware store, or residents driving their groceries home. Others in the village own mopeds, which are used mainly for personal and partner transport, but also can haul small cargo in a pinch. On my most interesting ride as a passenger on the back of one of these, I had a backpack with two boat oars strapped to my back and we spent the ride dodging low-hanging tree branches. It’s also a common sight for a moped passenger to be loaded down with groceries or have a small child in their lap. There are these options for vehicle transport, but most people on Stromboli walk. These modes of transportation allow for a greater degree of intimacy with the landscape as one moves through it (see DeCerteau 1984). In walking, one can take in much more information about the environment in real-time. And even in any of the vehicles used for transportation on the island, one is exposed to the elements. There is no privacy inside of a vehicle like there would be in a car. A traveler through the village in any mode of transport is constantly interacting and negotiating with the natural, built, and social environment, navigating cobblestones (whose impacts are felt more than they would be in a car), pedestrians in a narrow street, and the weather and winds from the sea.

It is the unique geography of this place that has shaped human transportation choices. On such a remote island, ability to manipulate the environment (by, for example, flattening hills to make a wider road) is limited by the ability to transport equipment and supplies. The volcano and its geography demands a certain kind of navigation around it by

virtue both of its steep and rocky terrain and its location smack dab in the middle of the sea. The village and human habitation on the island developed where it is in response to the volcano's eruptive patterns and direction of the lava flows. Historically (dating back to prehistoric times), lava flowed down the *Vecchia Sciara*, located on the southwest side of the hill. Now, the *Sciara del Fuoco* on the north side of the island is where *scoria* rocks tumble down and fall into the sea. Because of the volcano's agency and character, humans were forced to respond and react by settling in other parts of the island less prone to volcanic hazards. Human intimacy with the volcano's eruptive patterns guided their movements of inhabitation.

There was at one point a foot path connecting Stromboli (the village on the eastern side of the volcanic cone) and Ginostra (the smaller village on the western side), but a landslide in the early 2000s collapsed the path. Now, anyone wishing to travel back and forth between Ginostra and Stromboli must either: 1) Walk up and over, which is time-consuming, fatiguing, and not technically legal if you are not a certified volcanological hiking guide, or 2) go by boat, which is what the majority opt for. You are then limited by boat schedules if you don't own your own boat. Most of the islanders do not. One of the seasoned hiking guides and long-time resident of the island, Mario, works in Stromboli where all of the hiking agencies are located, but lives in Ginostra. He often has to leave early from dinners and get-togethers to make it to the ferry in time to get back home. He had his own personal boat, but preferred not to navigate it at night if he didn't have to.

In fact by virtue of its positioning as an island, and a small one with no airport, transportation to and from Stromboli to anywhere else is only possible by boat. These

limitations on personal mobility effect human social relations profoundly. One of my informants on the island, Mateo, was the proprietor of a particular popular *bar* (used in the Italian sense, this is not just a spot for drinking alcoholic beverages in the evening, but a site of social gathering for all ages at all times of day: to have a *cornetto* for breakfast, to pop in for an afternoon espresso, to enjoy a pizza in the evening with friends or family, or to drink beer and smoke cigarettes after work until late in the night). His was one of the larger gathering spaces on the island, located on one of the main town squares, and as such he became a de facto event planner for larger weddings and parties that took place on Stromboli. I had the opportunity to join him for a full-morning meeting and tour with a young couple who were planning their wedding on the island. The bride, Sara, a young artist from Milan, grew up visiting Stromboli for family vacations and told me repeatedly that she always thought it would be magical to be married on Stromboli. That the wedding would be a fairytale, a dream-come-true. What was a dream of a wedding, however, would be a logistical nightmare. The couple wanted to have their wedding reception in the town square of Ginostra, the even-smaller village on the western side of the island that can only be reached from Stromboli by boat or by hiking up and over the volcano. However, Ginostra's church was closed for construction and renovations after some weather damage, meaning that the couple's wedding would have to take place in Stromboli's church.

Mateo, Sara, and I took the early-morning ferry from Stromboli's port to Ginostra. All the time Sara gushed about how fabulous everything was going to be, how gorgeous the views were, and how she could not envision a more magical place to get married. The wedding guests would all come in a few days early, and a group hike up the volcano had

already been organized. Mateo and Sara discussed on the ferry ride over what the best way was to transport guests from the Stromboli piazza where the wedding would take place, to the Ginostra piazza where guests would enjoy the reception by the light of the western setting sun. There would be close to 100 guests in attendance at the wedding. Could all the guests fit together on the ferry? Or would it be better to rent private boats to take guests over? And if so, how many boats would be needed? Would they have to take multiple trips, or were there enough small private boats on the island to make a one-trip situation? Sara and Mateo passionately discussed the pros and cons of each option as I watched the south side of the island landscape passing us by through the ferry window. There were old people, and private boats would mean less walking, as they wouldn't have to depart from the port. But wouldn't it be nicer to have everyone together and keep the spirit of the party?

We arrived at Ginostra's port and hiked up into the village, where Lucia and several young men were working in a completely gutted restaurant. They were doing renovations for high season, including a newly constructed outdoor dining space. They served us espresso in paper cups from a machine placed on top of painting drop cloths, and we sat at a picnic table on the new patio to discuss logistics of the celebration. Mateo's restaurant was to provide h'ordevoirs and beverages for the feast as the guests arrived in Ginostra, while Lucia's restaurant would serve pasta at midnight. So getting the food over from Stromboli had to get worked out. Ice became an issue too. In Ginostra, a village with only 40 permanent residents, there wasn't an ice machine large enough to accommodate the hot-July needs of over 100 people dancing in the outdoor town square. So Lucia and Mateo

then began to plot an elaborate battle plan of how the ice would make it, still frozen, from Mateo's restaurant in the Stromboli square to Lucia's in Ginostra.

These negotiations required a high degree of specialized, intimate knowledge of the material and human landscape. Because of Mateo and Lucia's familiarity with the material landscape, they were able to troubleshoot exactly which parts of the geography would present the most difficulties in navigating around. And because of Mateo's long family history and network of connections on the island, he was able to suggest, by name, the people who might be able to help with this task—help which came in the form of the resources they were able to offer that might assist with this elaborate navigation of the landscape. Intimate knowledge becomes collective as humans come together socially to develop strategies for operating in uncertain environments. Landscapes become known by individuals through both habitual intimate contact and shared experiences with a community of others who are responding and reacting to the same environmental risks.

Chapter 6: Up and Down: Hiking the Volcano

In the way that Phaedra Daipha's forecasters go up against "local" and popular knowledge, "knowledge" of the volcano is not necessarily confined or even always afforded to those who study it scientifically. More often, the local people who have been hiking it for years who know "every stone like the back of their hands," as one of my guides put it, are the people who are said to know the volcano the best. Knowledge of the volcano for these people is like knowledge of the Amazon's rivers and root systems for Hugh Raffles' informants. I join Raffles in frustration with the term "local" knowledge and its diminished position of contrast to "global" scientific knowledge, and I join him also in arguing for considering instead an "intimate knowledge" of which there are varying degrees and that incorporates both scientific and non-scientific ways of knowing an environment as valuable and useful.

Zaza, raised in Lipari but having lived on Stromboli for most of his life, is known as the most experienced volcanological guide on Stromboli. He is revered by the other guides, often cited by them as the one who knows the volcano best. I spent a lot of my daytime hours in the office of Magmatrek, the most highly regarded of five or six different trekking companies offering guided hikes to the summit of the volcano where the frequent lava explosions can be viewed up close. Whenever I told any of the locals in the village about my project, nearly all would say, "You have to talk with Zaza." The younger guides in the company (most of the guides are young, single men in their thirties) also encouraged me to get to know Zaza, telling me that he knows more about Stromboli than anyone. These

young men had plenty of time to talk and answer my questions about the volcano--most of the volcano tours left between 4 and 5 pm, with the hikers returning from the summit in the dark at 10 or 11. During the day, they would just hang out in the office waiting around for tourists to come in and register for hikes, so I would hang around and ask them questions about their work and the volcano. There would often be a point in the conversation where the response to one of my questions would be, "I don't know. Zaza might know about that..." Another man, Stefano, was often mentioned by many of the locals when I asked about who knew the volcano best. He had since passed away, but for at least thirty years of his life had hiked up to the summit of Stromboli every day. He could make it to the *pizzo* and back in under an hour, while most tour groups take three hours to reach the top and another hour and a half to make it back down.

I had already been in Stromboli for over a week when I climbed to the *pizzo* for the first time. Anytime I met someone new in the village, they would first marvel at how long my planned stay was—many tourists stayed one night only, arriving in the afternoon to hike the volcano and leaving in the morning on the ferry—and then they would ask if I had climbed the volcano yet. "You haven't?? You have to! Why don't you go tonight?!" I usually responded that I was waiting for the weather to be right. One of the local hiking guide companies had a small office in the lobby of the bed and breakfast where I was staying, and when I came down to breakfast I would usually ask Silvia, the owner of the company, how many hikers were booked for that evening and what they expected the weather to be like. Salvo, an Alpine guide who worked for this particular volcano adventure company as he was recovering from a back injury, used an app called "WindFinder" to

make amateur predictions about what the weather would be like at the summit that evening. The more wind, the less predictable the summit conditions. On a still day, it was easier to anticipate that clouds would stay where they were or that it would remain clear for dazzling views of the sunset. Also on a windy day, the cloud plumes could highly decrease visibility. On a windy day, Silvia would usually tell me, "*Aspetta. Io, se fosse te, aspetterei a domani.*" I'd wait until tomorrow if I were you. Of course, I would get conflicting information and forecasts from different guides and different companies. Some would base their predictions on the direction the wind was blowing the plume, or how active the craters had been the previous week or that day. These factors all went into guessing whether or not hikers would be able to experience "*bell'attivit *" (beautiful activity) from the volcano.

About a week into my stay, on a Sunday, there was finally a clear day that almost all guides confirmed was sure to be the best day they had had in months for hiking. "You *have* to go today," I was told by Silvia, Salvo, and multiple other guides. "This will be the best day we've had all season so far." I finally got to join the hustle and bustle of the 4pm crowd from an inside perspective. Around 3:30pm, I ran to the restaurant in the square to grab a quick sandwich. All of my friends and informants there who I was close with by that point were thrilled that I was finally going to make the trek. It seemed like it was going to initiate me into something that they had all been waiting for. I wasn't even really a true tourist until I had climbed the volcano and seen the craters from the top. My backpack stuffed with snacks, a large water bottle, and a few sweaters as the company had recommended, and my grandma's inherited hiking boots on my feet, I joined the group of mostly foreign tourists who had begun milling around the exterior of the office, which had

not yet been opened. There were four middle-aged French men, there on a guys' trip, an Albanese couple in their early twenties who now lived in Naples, and an extended family group from the United Kingdom. Soon enough, our guide Alessandro turned up to unlock the office, pass out helmets to the group, and have us sign safety waivers. I was amused, though not surprised, that the safety waiver was nothing like the 10-page legal document that I would have had to sign and have notarized to take place in such a risky activity in the United States. It was a plain, printed quarter-sheet of paper with a mere few sentences in Italian, English, German, and French. "I acknowledge that hiking a volcano is inherently dangerous and do not hold the company liable." Sign on the dotted line I did, and was given a helmet, meant to protect my head in the case that an exceptionally strong eruption ejected some *scoria* rocks into the air high enough to reach the *pizzo* where we'd be viewing the volcanic activity. Some of the French tourists rolled their eyes and giggled at the helmet situation—if the volcano were to really erupt, would a measly bike helmet really do anything to protect us?

Alessandro, who led our group that day, was one of the northern Alpine hiking guides, on Stromboli only for a few weeks to help with the summer influx of tourists. He grew up near Milan and the Swiss Alps, and in conversations with him, he appeared to be frustrated with the particular work of the Stromboli volcano. For an experienced Alpine guide, the hike is laughably easy. And the guides don't work each day until 4pm, which, for my friend Fede, was the reason he loved the job—he had mornings and afternoons to swim, bike, run, and read. But for someone used to fast-paced city life or the constant adventure of being in the mountains, life on a small island with less than a thousand people

can leave an urban adventure junkie feeling a bit bored and restless during non-working hours. And for someone used to guiding experienced adventurers into the technically challenging Alps, it can be frustrating to be leading a herd of less-than-fit tourists of a wide age range and varying physical ability and stamina. In a similar way to how Gaston Gordillo describes in his article on “Terrain,” a sense of “localness” is produced and expressed through the body (Gordillo 2017). The closer a group gets to the summit, the more evident it is which bodies are habituated and conditioned to, or intimate with, this particular type of terrain. Alessandro’s comments to the group were mostly related to the physical and technical aspects of the terrain, and warnings and suggestions about stepping a certain way or using certain gear at a certain time—“now is a good spot for us to change into our dry shirts.” This approach differed vastly from other guides I hiked with who grew up on Stromboli or even in Sicily, who tended to also share history and cultural knowledge about the landscape as specific aspects of it came into view throughout the hike. Lorenzo, who had grown up on Stromboli, pointed out fields that at one point were instrumental to growing Malvasia grapes. He told the group of hikers the story recounted earlier of how the Aeolians became a crucial site for wine production in the 1400s during the French wine blight. As we ascended the hill and could look out far off at the sea and the horizon, he told us of how Stromboli was an important fortress because of its positioning within the Aeolian chain, and from how far off you can see a potential attacking battleship coming from Calabria.

Much like how certain landscape features became sites of moral instruction for the Apaches in Keith Basso’s account, particular features of the hike up the Stromboli volcano

afforded the opportunity for local guides with intimate knowledge of the geography to tell a story about mobility and risk. The landscape affected Apaches morally; this hiking landscape affects hikers and locals mobile-ly. As you move through it, memories of past mobilities, intimacies, and risks emerge through recalling moments of Strombolian relationship to the landscape.

Chapter 7: Back and Forth: Seasonal Migration

When I asked informants what the population of the island is, answers would vary widely. It depends on time, context, and who you consider to be part of the population. There are only about 200 people, by most estimates, truly considered to be permanent residents of Stromboli. These folks live on the island, grew up on the island, work on the island, and stay there throughout the long, hard winter months when work, entertainment, and community are incredibly scarce. These are the folks who weather the weather. The “permanent” population (those who are not tourists but stay on the island to work for an extended period of time during the high season) swells to somewhere between 600 and 800 between the months of April and November, with many property owners and seasonal laborers only coming to the island during the months of July and August, which is true high season for Sicilian tourism. Many tourism-based businesses, including the Centro INGV volcano science museum where I did much of my research on the volcanological history of the island, only open in July and August. On top of these 600-800 summer “permanent” residents, the island typically plays host to up to one thousand tourists during the most popular travel times.

Seasonal laborers come to the island during the summer from as close as the other Aeolian Islands and the coastal towns of northern Sicily and from as far away as Cameroon. During my stay I met two women from Cameroon who worked in small bed and breakfasts cleaning rooms, doing laundry, and serving breakfast to guests, and a Cameroonian man who was a sous chef and dishwasher for a local seafood restaurant. These people earn their

money between the months of April and November and are able to live and travel in their home countries and just be with family during the remainder of the year. Many of the servers and bartenders in the restaurants are young Italians (also a few Albanians) who either do the same—work during the late spring, summer, and early fall on Stromboli and travel or live in their hometowns without working during the rest of the year—or work on Stromboli during just the very high season (June or July through August) and work or attend school elsewhere in Italy during the school year. Martina works as a server in a cafe during the summer months and studies pharmacy at the University of Catania during the school year. Sofia serves in her father’s restaurant during the summer months, and left the island around the same time as I did to fly to the United States to work as a nanny. Nino serves through November and then returns to his hometown of Milazzo to enjoy a yearly temporary retirement with his family there. Giuseppe works remotely doing marketing and PR for a Paris-based environmental organization and runs the town’s library during the summer months, and in the winter months returns to Paris for a taste of city life and to attend company meetings in person. Rico attends physical therapy school in Naples during the school year, and fishes and works in his family’s *pescheria* between June and August.

Many of the volcanological guides who I met who do guided hikes to the summit of the volcano for tourists are also Alpine guides, and as summer is off-season for the Alps as there is no skiing available, they choose to spend their summer months guiding the volcanoes—both Stromboli and Mt. Etna. They joke about how even though it’s work, it’s essentially a vacation for them. The hike up and down the Stromboli volcano is an easy five hours with a light backpack for Alpine guides who are used to carrying heavy packs

in the snow to high elevations and camping for days at a time. I encountered people with varying responses to having these “northern” guides guiding a territory that isn’t native for them. Most seem to view it as a sort of necessary evil prompted by supply and demand—the guides who grew up in the north don’t know the Sicilian territory and aren’t as familiar with the volcano and the history of the area to share with the tourists who are climbing. However, there is currently a shortage of Sicilian certified volcano guides due to some political, logistical, and organizational snafus with the certification course a few years back, and the demand for guides on Stromboli is so high with the July/August influx of tourists that it’s better to have less-than-optimum (according to nativist narratives) guides than no guides at all with the island depending on tourism revenues to sustain itself throughout the quiet winter months. If the hiking companies only hired Sicilian guides, there wouldn’t be enough guides to accompany all of the tourists interested in hiking. Some of the older guides told me stories about how in the 1980’s and 1990’s, they would sometimes lead groups of up to 100 people to ascend the volcano. However, regulations have since been passed that require at least one guide per 25 hikers.

“*Come fa il tempo?*” and “*Quanta gente c’è?*” seemed to be the two questions I heard the most often from particularly the service industry professionals who I got to know on the island. The weather and the people. These two forces seem to work together to organize the economic activity and the lives of the residents of Stromboli, and the categories can be a bit fluid—if there’s bad weather, there are fewer people coming in on the boats. If the weather is good, there are more people. If the weather is good in the village, but with clouds above the volcano, still more people crowd the restaurants and bars since

it won't be a good day for viewing explosions on a hike to the summit. It effects time scales, too. Vacation time scales. If there are lots of groups, lots of people, ascending the volcano, some groups have to wait until later to leave. And there's more waiting on the ascent as groups end up behind another that's slow, or have to pass another group that has stopped for a water break. Whether it's hot or cool then effects ascent time. It takes longer with the sun beating down, but perhaps even longer in the dark.

The 4pm hour each day sees the square flooded with tourists in boots carrying hiking poles and water bottles, strapped with backpacks. When the sun starts to arrive over the volcano and the eastern side of the island cools down in the shade, a buzz of activity picks up and increases with the passing minutes. Between 1 or 2 pm and 4pm, the village is almost completely silent. Many of the stores and restaurants close during that time, and shopkeepers and chefs go home to have lunch with family and friends, or head to the Ficogrande beach. The town square clears out and becomes silent save for the sound every five minutes or so of a lone Vespa whirring through the square on its way to a friend's house across town, or a tourist couple meandering the narrow cobbled streets on a self-guided tour. But around 3:30, the first pair of hiking boots tromps into the square and sits on the low wall overlooking the Tyrennhian to wait for the Magmatrek office to open and start with their pre-hike orientation and helmet distribution.

Around that time, the *Noleggio Scarponi* shop (boot rentals) opens their doors and Olivio, a tall, skinny, curly-haired young shop manager, starts passing out boot pairs of all sizes and shapes to hikers who had come to reserve a pair earlier in the day. By 4:30, the square is usually quite crowded with both tourist activity and locals observing their daily

routines—stopping into the bar for an espresso before a few more hours of work, or a mid-afternoon gelato, or Francesco, the oldest man on the island, who would just sit in the square every day at this time and watch and drink water. Occasionally, this was also the time that preparations would start for local celebrations at the main Roman Catholic church located in the square. Streamers hung and cocktail tables placed, I witnessed preparations in the 4pm hour for the children’s confirmation celebration one Saturday, and the Festa di San Vincenzo, who is the patron of the island, another time. The specific geography of the volcano constrains movement of tourist groups by its size—it takes a certain amount of time to get to the top. Views of the Tyrrhenian from the top of the mountain are ideal at sunset, and the frequent lava explosions are more spectacular after dark. So the groups time their ascent to make this experience possible. Particularly in winter when the weather at sea can make the water dangerous for boats to travel, Strombolians are sometimes forced to extend stays in Naples, Milazzo, Messina, or Lipari when boats are unable to travel. Some are fortunate to have family members in these port towns who will house them, others must pay for expensive hotel rooms to have a bed to sleep in while they wait for the sea to be traversable during one of the scheduled twice-per-week *aliscafi* (hydrofoil boats). Sometimes the boats do go, but are forced to stop short of Stromboli at Lipari, where passengers are faced with a similar dilemma of finding family or shelling out for a hotel.

The river flows both ways. Strombolians also get stuck *on* Stromboli when boats can’t come, leaving many unable to complete essential business and personal errands to acquire resources that can’t be found on the island. Many grocery items are shipped in from Naples, as is potable water for drinking and showering. It’s not rare during the winter to

encounter bare grocery shelves and dry kitchen taps because the ships have been able to dock to deliver supplies. Even during the summer, the ship that brings the island's potable water supply would occasionally arrive a day late to the island. There was a lunch that I had with some of the volcano guides in the home that they shared where we were unable to do the dishes or flush the toilets because they had used all of the water from their cistern already that week, and the water ship that should have arrived that morning had been delayed until the next day.

This limiting travel situation affects family life and relationships. There is an elementary school on Stromboli, but when children grow old enough for high school, they must attend either in Lipari or Milazzo. Many families move off of Stromboli entirely when their children reach high school age, but some decide to stay—meaning the children commute by boat to Lipari, missing school if the boats can't go, or the father stays on Stromboli to work and take care of the house while the mother rents an apartment in Lipari or Milazzo with the children. This extreme limitation on mobility has broken up multiple marriages that I am aware of from my ethnographic work, and surely severely strained many others as families are forced to deal with distance in a situation that's largely out of anyone's control. They are at the mercy of the volcano, the weather, and the boat schedules. As Eyal Weizman points out in *Forensic Architecture*, “giving particular forms to space has profound political implications because these forms (walls, roads, towers) affect mobility, visibility, and the spatial reach of technologies of rule” (Weizman 2017). While he writes specifically about human-fashioned infrastructural elements, the same argument can be made about naturally occurring spatial forms and the mobility infrastructures that

are built to navigate them. Ports, boats, and the boat schedules are one way that this plays out in the lives of Aeolian islanders. Substandard port construction historically kept boats from landing on the island when weather is bad, particularly in the winter. Even today, certain boats (the hydrofoils) are more able than others to navigate stormy winter seas and dock even under harsh and turbulent port conditions. Ferry companies also, of course, attempt to remain profitable. So, in the winter months when tourism dies down, scheduled ferries will often be cancelled simply because not enough tickets have been sold to render the trip “in the black.” The companies are government subsidized, and they are supposed to guarantee a certain number of trips per week even in the winter months, but I heard a few residents complain of times that the “guaranteed” 7:30 am ferry from Milazzo had been cancelled and they’d had to find family to stay with.

Scientific instruments, plants, animals, roads, and buildings— expand our notion of site, but issues of migration and cultural identity also can expand and contract the population--who belongs to Stromboli? To whom does it belong? Why are some Australians and Tuscans more Strombolian than people who are living there now? While I was doing my field research, I had a number of seasonal workers who stayed on the island for 6-9 months out of the year, and had done so for years, tell me that they didn’t “live” (*vivere*) on Stromboli, they just “slept” (*dormire*) there (personal field notes). But it seems many who were born on the island who left at a very early age had more claim to being “Strombolian” than those who had spent more time in the place. Pino, a server at the main bar in town who had been working there for at least half the year for over a decade, when I asked him if he lived on Stromboli, he told me, “No, *io vivo a Milazzo. Dormo a Stromboli*

per l'estate, ma vivo a Milazzo." I live in Milazzo [the closest port town]. I sleep in Stromboli for the summer, but I live in Milazzo." The concept of life, or living, in a social sense seems to be tied to the seasons. Sandra, a woman from Cameroon who made her living doing laundry and cleaning for a small bed and breakfast on the island from April to November each year, made similar comments about herself and a few other Cameroonian friends on the island—she looked at me a bit sideways as if to say, "Don't be ridiculous!" and told me of course they didn't live here. The summer is one thing, the summer isn't your life. Where you are during the winter is where you live, where your roots are, where your ties are. It is difficult to untangle exactly who is included as the human components of a cultural landscape or total human-ecological picture of the island when so much of who belongs in what categories depends on who is where when, in what season.

Even Andrea, the proprietor of the same bed and breakfast where Sandra works, had a difficult time telling me he was Strombolian, though he had spent even the winters there for over a decade. His metropolitan roots (he is from Naples), love of art, and particular taste (flamboyance, as some of the other islanders would call it. "*lui e un'uomo molto particolare.*") drew him to be friends with many of the artist types in Stromboli who stayed there for the summer to work or attend art events (of which there are many during the months of July and August). His friendship with these upper-class metropolitan people who came in during the summer from the cities made him continue to be viewed as an outsider by many of the locals, despite the fact that he had invested even winter time there and was in fact the only non-scientist to remain on the island during the aftermath of the devastating 2014 tsunami.

I have always been curious about how fear affects human decision-making, and under what conditions humans decide to suspend fear-based responses to, in a sense, choose against their biology. Fear is physiologically tied to movement in the human neurobiological network. When a human feels threatened, the biological response is to “fight, flight, or freeze.” This means that when we experience fear, we are compelled to movement-based response: to move toward the object of fear (fight), to move away from it (flight), or to cease moving altogether (Van der Kolk 2014). Movement is a connection of a body to its environment in time and space, and bodies must move differently through different spaces. Fear-induced movement in humans living near volcanic activity and other uncertain environmental features creates different social categories: those who stay, those who go, and those who move toward and lean into the danger presented. Thus fear becomes not only an individual psychological experience, but a social process. Shared responses to fear become a social actor.

In Stromboli, a mass exodus from the island in the 1930s due to both environmental and social factors (a large eruption and the outbreak of the second World War) grouped Strombolians into “those who stayed” and “those who left.” Today, there are those who stay even though raising children can be difficult and isolating on an island in the middle of the sea. There are those who, when their children become school-age, leave the island desiring a “better” life for their families. My ethnographic interviews with those who have left show that those who leave have strong emotional ties to the island and a fear of being forever separated from their beloved homeland. Many have incredibly mixed feelings about having left, feeling they were forced by environmental circumstances to leave the

place that they loved. These sentiments tend to be gendered. I found it much more likely that women would find it self-evident that the family should leave in order to provide better educational opportunities for their children, while the men felt a stronger attachment to Stromboli and ambiguity about having made the “right” choice to leave. Intense longing for home was evident in those who I spoke with who had been separated from the island, many of whom made efforts to connect with others. One man joked with me that the largest population of Aeolian Islanders is in Melbourne, Australia, and then told me it’s funny, but it isn’t a joke, it’s true.

I met a number of other displaced Strombolians—those who had grown up on the island but moved away—who visit during the summer, and almost all expressed to me an anxious ambiguity about the status of their decision to move away: had it been the right choice? A deep longing for the place of “the heart” as they expressed it to me was evident in this uncertainty. There was evidence that it was what was “best” for their families—the head, logic, rationale, said that the decision was right—but the heart, and the ache it feels to be so far from one’s homeland, said otherwise. It feels wrong to be away from the place that you love.

Leonardo, an informant with whom I connected via Instagram before I first visited the island, runs an Instagram account and YouTube channel dedicated (intensely dedicated, posting sometimes multiple times daily) to sharing the history and culture of Stromboli. His attachment to the place of his upbringing is expressed through these daily long-distance rememberings. There are a number of other such accounts, by both displaced Strombolians—those who grew up on the island but have moved elsewhere—and visitors

or seasonal (summer) residents who are particularly attached to the island. Just as scientists connect with the volcano remotely through sensing technology, people with strong place attachments to Stromboli choose to extend their presence digitally to be in memory and emotion where they can't be in space because of perceived environmental threats to the well-being, lifestyle, and education of their families. The ethos of Stromboli exists in digital space to be visited by those who miss it and can't be there bodily. My closest friend on the island, Linda, has said that she felt an immediate strong attachment to Stromboli the first time she visited there with her mother. So strong, in fact, that she ended up leaving a job as a dentist's assistant to come be a seasonal prep cook for the summer in one of the restaurants. She and I would often joke about the number of Stromboli- and Aeolian Island-dedicated Instagram accounts that we were following from our respective homes when we were away from the island, and would share new accounts that we found (often through suggestions from the Instagram platform or through searching hashtags such as #stromboli or #strombolivolcano) with each other. For us, engaging with the photos that people posted was a way to maintain a low degree of intimate connection with a landscape that we both had grown attached to and were absent from. Linda told me once and I also heard from others that there is something special about Stromboli—it's magnetic, it draws people to it. It chooses certain people to draw to it. This deep sense of place attachment is figured in these conversations as not being only about human attachment to environment, but about the island's agential, desiring presence. Humans are attached to their landscape, and also the landscape is attached to certain human persons.

Chapter 8: Conclusion

Human movement in volcanic zones requires and affords an intimate attunement to one's landscape. My ethnographic data from Stromboli shows that humans living in these types of places willingly and eagerly make "risky" decisions for intimate knowledge of the spaces and environments they call home. When disasters occur, they don't blame the environment or second-guess their own choices to stay in proximity to volcanic and weather-based hazards, but instead they negotiate with and navigate uncertainty presented by the volcano and the sea as mutually-agentive relators.

It is incredibly important for anthropologists studying disaster and risk to consider the deep and varied ways that humans seek intimacy with their environments even when it presents a risk. Vulnerability is a state that humans sometimes consciously choose for the positive rewards it presents, and for those who are "vulnerable" to certain environmental hazards to be written merely as victims of their environment or of social politics (as they sometimes are in the literature, see Faas and Barrios' 2015 review article) oversimplifies and overlooks deep human sense of attachment to place. I have found that much of the other anthropological research in risk and disaster tends to approach environmental vulnerability from this type of political ecological perspective, where power and hierarchies are at play that make certain subaltern populations more vulnerable to environmental catastrophe than others. This is, of course, an important perspective and one that may be true for many field sites. My ethnographic research, however, shows that in this particular site and possibly many others, humans have agency in their choice to stay in

hazardous zones and they do so for positive and intimate reasons. Strombolians, Catanians, and hikers at the Phlegrean Fields come intentionally into proximity with their environment despite the risk it presents in order to enjoy the increased intimacy with a geographical place and experience feelings of closeness with that place. These are unique places where what is interior to the earth comes out; the earth's secrets are revealed to humans and these humans stand in awe for the chance to be close to it.

Furthermore, the environment that these people relate to has an agency of its own. Landscapes cannot be written off as a passive backdrop to human action and choices, for humans to predict and react to, but they demand attention and are active participants in a relationship with their human relators (Chakrabarty 2009). Landscapes have agency and power, and they are not givens but are unpredictable, uncertain, moving, adapting, flowing socially with humans, plants, and animals. Anthropologists studying disaster and risk cannot stop at studying the "social construction" of risk, as many studies tend to focus on, but the agential presence and character of the particular hazards or danger presented by a living, mobile, and uncertain landscape.

So why do people choose to live with environmental risk in a volcanic island environment? I found in my research that deep personal attachment to place and home makes humans willing to take what scientists consider major risks. This attachment to place is even stronger in a volcanic island landscape than in other places because of the unique affordances for intimacy that this type of environment provides. Intimate knowledge between places and people grows and is expressed through movement and mobility. All this must be considered in our reckoning of and writing about "landscapes."

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