Tracking Meat of the Sand
Noticing Multispecies Landscapes in the Kalahari

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Abstract This article explores the skilled arts of tracking and gathering as methods for noticing and theorizing multispecies landscapes in the Kalahari Desert, Botswana. Tracking is typically used to describe a practice of following animals, usually for hunting, whereas gathering primarily refers to the collection of plant and fungal materials. The author presents a case in which these terms have been scrambled during long-term ethnographic field research. The author and his interlocutors tracked the Kalahari desert truffle, an experience that demonstrates how aspects of tracking extend to gathering, but also how the practices are attentive to the movements of landscapes more broadly. This form of tracking attends to multiple spatial and temporal movements that include nonanimals and other nonhumans. It represents a way of noticing the assemblages of more-than-human relations that make up landscapes. These convergences, first identified through tracking, are then explored through the more distributed analytic of gathering. Inspired by Ursula LeGuin’s call to describe stories of gatherers and collectives in her “Carrier Bag Theory of Fiction,” the article argues that thinking tracking through the gathering analytic helps articulate a “carrier bag approach” for understanding landscapes through the gatherings of relations with which they emerge.

Keywords multispecies methods, Indigenous knowledge, tracking, gathering, Africa

Anthropologist Tim Ingold has long argued that landscapes can best be understood as emerging through interwoven, multitemporal lines—or tracks and trails—of movement.1 One way of attending to and noticing these movements is the skilled “art of tracking.”2 Indeed, Ingold and other scholars have pointed to tracking, and the tracks and trails that people follow, to highlight how central movement is to the process of coming to know and interpret landscapes.3 Tracking, however, is a practice most often associated with identifying and following the spoor—the cumulative term for tracks.

1. Ingold, Lines; Ingold, “Temporality of the Landscape”; Ingold, Being Alive, 149.
2. Liebenberg, Art of Tracking.
and other signs—of animals and other humans, which are not themselves seen. But what about the tracks and trails of other landscape actors and movements that are not human or animal? Unlike tracking, gathering is the practicing of finding and collecting plants, fungi, and other entities often described as being immobile and visible. But these, too, have mobilities that are important for understanding landscapes. In practice, the signs of movements that trackers attend to are not limited to animals but extend into landscapes to include plants and fungi, alongside other landscape patterns. How, I ask, can close attention to arts of tracking scramble conventional distinctions between tracking and gathering? And how can an expanded notion of tracking contribute to practices for noticing and coming to know not just animals, but the diverse movements of landscape assemblages, including things such as plants and fungi?

Ingold notes that when tracking, “you lay one line of tracks across the expanse, looking for signs of another line of motion that would lead to your objective. Thus the entire country is perceived as a mesh of lines rather than a continuous surface.” This is perhaps true to an extent, but these meshworks of lines move at different rates, have different ranges, and operate at different scales in ways that can be uneven and messy and involve certain erasures. As human geographer Doreen Massey has argued, it is critically important to attend to how these varied movements and interweavings are distinct and emerge in uneven ways so as not to flatten those relations that hang together in landscapes. In this article, I propose that the skilled “art of tracking” is a key technique for noticing landscapes precisely because it attends to these multiple, distinct trajectories and how they gather, as part of the process of locating the particular. These distinct trajectories move in and out of landscapes over time; thus tracking also attends to the tensions between presence and absence, crucial to understanding the contingent relations with which landscapes emerge.

My inspiration for this more expansive exploration of tracking is a mycorrhizal fungus called the Kalahari desert truffle (Kalaharituber pfeilii). During several months of research in 2009 and then twelve months between 2015 and 2016 in the western regions of the Kalahari Desert in Botswana, I encountered the Kalahari truffle while learning to track with San trackers who have been banned from subsistence hunting by the Botswana government. Despite this ban, my interlocutors continue to track in their daily lives. They track animals, even though they are not allowed to hunt, out of a general interest in who and what has been moving about the landscapes. But they also track plants and truffles, the arrival of cattle into wildlife areas, changes in the weather, and the ways roads, villages, and other infrastructures bring new movements to their

4. Liebenberg, Art of Tracking, 69; Bieselee and Barclay, “Ju’Hoan Women’s Tracking Knowledge”; Shaw-Williams, “Social Trackways Theory”; Gibson, “Tracking Skeim (Sly/Surreptitious/Covert) Signs.”
5. Liebenberg, Art of Tracking, 43.
6. Ingold, Being Alive, 149.
8. Rose and Wylie, Animating Landscape, 475.
environments that inhibit others. With them, I came to understand tracking as part of a broader repertoire of noticing the shifting material relations of landscapes, how they come together, and how they change.

This broader repertoire is key for finding and gathering truffles. First, focusing on how the Kalahari desert truffle is tracked and gathered helps demonstrate how the practice of tracking is more broadly attentive to signs of movements that are not limited to animals but reach into landscapes. Second, though gathering is usually associated with the practice of collecting nonanimals that are considered immobile, tracking truffles troubles this implication by attending to the multiple, relational movements and temporalities through which truffles come into being. Furthermore, while gathering is a practice, it is also a powerful analytic for describing landscape assemblages that when woven together enhance tracking as an art of noticing landscapes. My contention is that conjoining tracking and gathering can help center the multiple movements and temporal rhythms of more-than-human lifeways that are not so easy to see in landscapes. To elaborate this understanding of tracking, I begin with the first time I learned that San trackers track more than animals. This leads into a critical description of the curious Kalahari desert truffle and the sets of more-than-human relations through which the truffle and Kalahari landscapes emerge.

**Learning to Track**

On a tracking excursion in 2009, !Nate and Karoha showed me a track that did not belong to an animal. It was late summer, and recent rains had left the sand firm and the air fresh. The rain had washed away old animal tracks so only the freshest of prints were visible in the sand. As we paced the landscape, weaving our way through the bush, !Nate and Karoha began walking toward patches of grass, sweeping large tufts to the side and quickly glancing to the sand without stopping. I assumed they were looking for animal tracks hidden by the grass, but unbeknownst to me, they were tracking something else. Karoha then reached into the sand, pulled something out, and put it in his pocket. He said something to !Nate that was mostly inaudible to me but sounded something like !xaa. Though we continued on, our pace slowed and I quickly noticed !Nate also reaching into the sand, pulling things out.

While walking through the bush, my tracking teachers often collected different plant leaves and berries or stopped briefly to dig and collect roots and tubers. But this was something different. “It is a meat,” Karoha said, “it is a meat of the sand,” before handing me a roundish sandy lump. Though I did not know it at the time, he and !Nate had begun tracking this meat as soon as we set out earlier in the morning. All the signs pointed to its arrival: the recent rains, the cool air, and, importantly, the convergence of the vegetal life and sand composition that this “meat of the sand” likes to live with. !Nate then called me over and pointed to a crack in the sand—the track of this meat—

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and gestured toward me to dig it up. I asked him how to do it but he responded matter of factly: “You must do it to know it.” In teaching me to track, my interlocutors often emphasized that doing is knowing. After my fingers bumbled about in the sand a bit, I pulled out a lump of this meat from the sand. We spent the rest of the day tracking animals and this meat in the sand, gathering the meat as we found it.

I came to know this “meat” as ṣhama10 (in !Xóõ), or mahupu11 (in Setswana), and whenever we located the cracks in the sand, or tracks as my interlocutors called them, we collected these fleshy morsels, roasted them under the coals of our campfire, and were treated to a delicious meal. Mahupu, I would learn, are also known as Kalahari desert truffles (Kalaharituber pfeili). The noted anthropologist Richard B. Lee12 included them in his list of important gathered “plant resources,” describing the desert truffles as “superb” and “reported to be the peer in taste of the Perigordian truffles of France.”13 The taste is hard to describe: a bit like a mixture between a mushroom and a groundnut. Even more, their taste resembles the fresh smells that hover in the air after it rains in the Kalahari. And, indeed, their texture is meaty.

Mahupu, when present (which is not often), became one of the things we tracked the most. That they were described to me as “meat that make tracks” seemed similar, at least rhetorically, to the well-established association between tracking and animals. But they are not animals, my tracking teachers insisted, though they are meat. Tracking them instead of animals—or, rather, together with animals—broadened my understanding of the purpose of tracking from animals, to truffles, and, from there, ultimately, to landscapes. Truffles form relations with others that gather in and with landscapes until they form this meat, which makes cracks in the sand as it swells. Despite the self-evident materiality of the truffle and its crack, mahupu is most often tracked through its nonpresence. That is because, as we will see, these truffles emerge through their material relations with Kalahari ecologies, leaving tracks in the landscape even when their fruiting bodies are nowhere to be seen. While learning to track, truffles revealed how the practice attends not to singular, bounded entities located in landscapes but to multiple, emergent relations that bring more-than-human landscapes into being.

Landscapes are lively, dynamic spaces of emergent relations, full of human and nonhuman movement.14 Far from static, they are the sedimentations of movement over time, gathering within them the stories of more-than-human histories and emergent futures. Environmental humanities, and scholars from related fields, have become

11. Because I worked with people who spoke different first languages—!Xóõ, G/wi, and Sekgalgadi—Setswana often acted as the bridging language. For this reason, my interlocutors mostly used the word mahupu to refer to the truffles when speaking to me. For consistency, I use the word mahupu interchangeably with truffle throughout this article.
14. Massey, For Space; Ingold, Lines, 149; Ingold, Being Alive, 47; Tsing, Mushroom, 152–63.
increasingly interested in describing these stories, developing methods that extend social analyses toward multispecies landscapes. Focusing their attention on more-than-human socialities and relations has reinvigorated questions about landscape, moving away from considerations of the simply cultural or representational landscape to and from which meaning is ascribed by a perceiving subject, or the natural landscape of an object world “out there” to be known authoritatively. This article furthers this work, developing the practices of tracking, and then gathering, as methods and analytics for better understanding and describing the relational, more-than-just-human dynamism of landscapes.

When considering the complex relations that make up landscapes, environmental humanities scholarship has developed, in part, through a dissatisfaction with referring exclusively to the natural sciences for insights into environmental processes. In doing so, scholars from the traditionally humanist fields have sought to notice—and have attempted to resist—the anthropocentric bias of their frameworks. An important model, for me, has been the “arts of noticing” that Anna Tsing elaborates in conversation with other colleagues located across a variety of disciplines, while also drawing firmly from anthropological methods. These arts of noticing gather together a number of skills and crafts—walking, collecting, noticing plant and landscape morphologies, to name a few—that are akin to, and draw inspiration from, the methods of natural historians. They remind us that field observation is key to both scientific and anthropological practices. Because observation is a situated and open-ended experience, there exist numerous possibilities for paying attention to the more-than-human relations that make up landscapes and their dynamics.

In conversation with these approaches, I aim to further develop this program of illuminating environmental liveliness in times of global disturbance and devastation. In doing so, I pay a different attention to the liveliness of landscapes—not only listening and observing but also making space for landscapes to respond—in an attempt to push beyond the bounds of established subjects and objects of Western disciplinary knowledge. I do this by focusing on the “art of tracking” as method and its relationship to gathering. In this sense, the art of noticing I develop is determined less by the language and concerns of the natural sciences. Instead, I turn to my interlocutors, San trackers in

18. Tsing, Mushroom.
20. Liebenberg, Art of Tracking.
the Kalahari Desert, to consider how their methods of noticing, tracking, and gathering might inspire a rigorous attention to more-than-human landscapes.

With this in mind, I take up Donna Haraway’s call for “stories of becoming-with, of reciprocal induction, of companion species whose job in living and dying is not to end the storying, the worlding.” Haraway calls this commitment “staying with the trouble.” While drawing from an anthropological tradition centered on the Kalahari San—the histories of which have been subject of debate and critique—this article “stays with the trouble” by reorienting its attention toward more-than-human landscapes.

**Tracking after Hunting**

That tracking is more than just a way of relating to animals arises empirically out of my research experience of walking through Kalahari landscapes with my tracking teachers. Social, political, economic, and environmental transformations have helped create an unfortunate context in which tracking was not associated with hunting, as it would have been normally. By the time my research began, wildlife populations were declining significantly, hunting had been banned and gathering activities limited, and remote dwelling Kalahari communities had become increasingly dispossessed and marginalized.

Today the Kalahari is encroached on by a variety of forces, including a commercial cattle ranching industry that is eating its way into vital wildlife corridors. I first met !Nate and Karoha, who were introduced in the opening vignette, along with Njoxlau—three of my primary tracking teachers—not as trackers on the hunt, but as data collectors employed to count tracks by a conservation research project conducting surveys to estimate wildlife populations.

In this context, tracking was not associated with hunting. However, when following animals it was clear that tracking involves much more than attending to individual tracks and their relationship to individual animals. Rather than simply following an animal in static space, skilled trackers track lively spaces of emergent relations through material traces of movements that help anticipate or speculate about encounters. They continuously notice and follow signs of a variety of phenomena, not only animals. Tracking has always been about more than animals and the hunt.

Animals are not directly observable most of the time when tracking. This is tracking’s raison d’être: if one can see an animal, there is no need to track it. Instead, trackers infer the past or future presence of an animal by attending to an array of signs: the way in which sand is displaced, how a piece of grass is bent or grazed, the direction the wind blows, the patterning of vegetation and sand compositions, sporadic rains and the

arrival of possible watering holes, among many others. In other words, what is observed is the landscape. Through tracking, places become familiar in their particularities (e.g., a specific animal, path, or place remembered from past encounters). Yet those particularities also hang together to generate the more general landscape forms that humans and nonhumans coinhabit (e.g., the types of habitats within which particular encounters might be anticipated). On the morning I first encountered the Kalahari truffle with Karoha and !Nate, for example, the two trackers not only were looking for animal signs but also noticed the convergence of a variety of other factors that suggested the potential presence of truffles: the recent rains, the temperature of the air, patches of grass that truffles like to live with. Anticipating encounters with truffles, the trackers followed these patterns to a place where they might notice the truffle’s signs. They were tracking the landscape to track truffles.

This engagement with tracking also arises out of an ethnographic attempt to engage with more-than-human socialities beyond animals. While the stories of animals are important, animals have too often been privileged as possessing something that is comparable to human consciousness and, with that, an ability to make worlds. With animals, consciousness and intentionality have tended to be the comparative categories for assessing sociality, limiting the range of nonanimal socialities available for consideration. This privileging of human-animal relations, Michael Marder argues, appears to follow the tendency in the human-centered Western tradition of philosophical thought in which, though animals may have been marginalized, “non-human, non-animal living beings, such as plants, have populated the margin of the margin, the zone of absolute obscurity undetectable on our radars of conceptualities.” Plants, fungi, and other nonanimals, however, are important landscape constituents that do things, have histories, make worlds, have effects, and are good to think with. Recently, scholars have been arguing that plant and fungi socialities deserve more attention in multispecies analyses. Yet considerations of how plants “act” or even “think” are still sometimes constrained by animal-centric frameworks based on understandings of consciousness and intentionality deemed relatable to humans and other animals (even if only as metaphor).

Science and technology studies help here. Writing against theories of agency that center on the “heroic” human individual for which nonhuman entities exist merely as resources, feminist science studies scholars such as Annemarie Mol, Karen Barad,

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26. For a rich discussion about the role of trackways in triggering memories and gleaning social-environmental information, see Shaw-Williams, “Social Trackways Theory.”

27. Tsing, “More than Human Sociality.”

28. Marder, Plant-Thinking, 2.


31. Barad, Meeting the Universe Halfway.
and Natasha Myers have in recent years sought to develop more expanded, more distributed understandings of agency. Their theories make space for the agency not only of nonhumans but also of nonanimals; they are less determined by the figure of intentionality, utility, and linear causality found in anthropocentric models of the acting individual. Such scholars argue that focusing on the more-than-human affordances of particular situated practices (rather than isolated individuals) offers a far better foci for grasping the actual dynamics of material semiotic relationalities. This lesson is particularly important for thinking about the worldings of nonhumans, and especially of nonanimals such as plants and fungi, since these are precisely the forms of life that too often fall victim to flattened and oversimplified senses of agency.

Noticing by way of tracking helps challenge the frequent description of gathered things—plants, fungi, and other nonanimal materials—as immobile resources framed in terms of human use. Tracking shows that these materials are themselves mobile, lively doers of landscapes; it brings us into the mobility of landscape assemblages. Tsing describes the ecological concept of assemblages as open-ended gatherings that “allow us to ask about communal effects without assuming them” in how material relations come together. Tsing, however, finds that gatherings alone are not enough. She argues that we need more than a way of just seeing how lifeways come together as gatherings; we need to see how lifeways are made together with nonliving ways of being. Importantly, she asks: “How do gatherings become ‘happenings,’ greater than the sum of their parts?” Elaine Gan and Tsing suggest that the coordination of multiple temporalities, in the coming together of many trajectories, is key to understanding these “lively practices of multispecies sociality.” Gathering, in this sense, is a way of describing particular landscape doings and their socialities, and tracking is a way of learning how those gatherings become happenings beyond individual units or parts.

To probe the question of how gatherings become happenings, I employ gathering in its double meaning as both the coordinated practice of collecting and of coming together. Gathering, in its first sense, is the practice of finding and collecting, which I elaborate through the premise of tracking landscapes. The second sense of gathering is the multidirectional practice of coming together, or assembling, materially and phenomenologically, whereby lively entities emerge in and with the landscape through their relations with other things. This second sense is loosely interchangeable with assemblages but emphasizes their social aspect. Attending to gathering in these two senses shows how the ways in which people find and attend to the things they gather has much to teach us about the worldings of those things.

32. Myers, “From the Anthropocene to the Planthroposcene.”
33. Abrahamsson et al., “Living with Omega-3.”
34. Mol, Body Multiple; Haraway, Companion Species Manifesto.
35. Tsing, Mushroom, 23.
Tracking and gathering also hold a more conceptual role in my work. In particular, the approach put forward here thinks with tracking and gathering conceptually by attempting to go beyond the philosophical limits of the “man the hunter” paradigm, the challenging of which was one of the most important contributions of Kalahari anthropology. This understanding of “man” was based on the assumption that most hunter-gatherer societies lived in a context of resource scarcity but were able to survive on the meat that men provided. Gathering was thought to be an ancillary, mundane activity and carried out only by women, who relied mostly on the meat hunted by men to survive. Anthropological research in the Kalahari played a significant role in challenging this assumption: anthropologists such as Richard B. Lee, Jiro Tanaka, and George B. Silberbauer, among others, showed that gathering—carried out collectively, mostly by women but also some men—rather than hunting was the primary source of subsistence in the Kalahari, and that gathering was more efficient and less labor intensive than hunting. The hierarchical division of labor between hunting and gathering has been largely discredited thanks to this work, but it has had residual effects in the ways that animal socialities have been privileged over nonanimal ones as more relatable and worthy of our philosophical considerations, even as nonanimals such as plant and fungi continue to be treated as mere objects or resources. The hunting narrative has partially impeded an understanding of tracking as a broader “arts of noticing,” while also obscuring the possibility of nonanimal socialities. Centering the practices and politics of gathering allows for a different kind of narrative.

This critique resonates with another powerful reworking of “man the hunter,” developed by feminist science fiction writer Ursula LeGuin in her “Carrier Bag Theory of Fiction.” LeGuin is concerned about the overemphasis on the hero who acts. While the hunter-hero makes for a good story, LeGuin argues, this trope is too reliant on the action of a hero that culminates in a kill. It reflects individual, masculine, “heroic” acts but silences the stories of everything else, including the gatherer. As LeGuin teaches us, while we too often tend to be pressed into the story of the hero, that is “his” story, not the story of “we.” It is much harder to tell the story of the gatherer. To do this, LeGuin suggests turning away from the weapon and toward the bag or container. This figure, rather than leading us to heroism and killing, gets us to collecting, collectives, and livability where things are gathered and gather together.

This understanding of gathering is particularly useful for describing landscapes through their collective relations. Tracking opens up not as a “skill of the kill” attentive to the action of individuals but as an art of gathering signs of movement within

39. Silberbauer, Hunter and Habitat.
41. A point that also resonates nicely with Annemarie Mol’s post-ANT critique of agency and action described earlier.
landscapes and a way of noticing how landscapes, too, come together through the gatherings of different relational actors—both human and nonhuman—at multiple scales. An art of noticing tuned to the stories of carrier bags. How, then, does tracking truffles teach us about the gathering of landscape relations?

From Spore to Spoor

In this section I describe the truffle as a gatherer of landscape relations through its entanglements with sand, water, and plants. Figure 1 is a mahupu track that marks its arrival in the landscape. The track, or spoor, helps tell stories of how gatherings coordinate. The damp sand swells, bulging until eventually the rain-smoothed surface cracks, creating small subterranean openings. "It is like a tent," !Nate told me, "but it is broken." Reach into the openings and you find the source of the swelling: a spherical lump submerged in the sand. Gently dig under it, being careful not to break or damage it. Cup it in your hands and pull it out. There is a slight, almost imperceptible snap as the sand releases its hold. In your hands you now hold the "meat of the sand." It does not just live in the sand, my interlocutors told me, it is meat made by the sand. This meat looks and feels a bit like a potato, but more humid and lumpier. This meat of the sand is not a self-enclosed entity but made of sand, rain, and—as we will see—a series of ongoing relations with others in Kalahari landscapes. It is a gathering, and the tracks are spoor that signal a happening.

There is a small but distinct nub on one side where it detached from the sand. My informants call this nub its navel, or belly button (fig. 2). This nub marks the meat's
severed connection to the sand and its lifeworld. It must be left intact in the sand or else the meat will not grow there again, I was told. Kalahari sands form one of the largest uniform sand sheets in the world. Unlike other soils, the sand there is mostly nonpedogenic: while it may contain biotic elements, biotic processes are not the primary drivers of its formation. Through the entanglement of the sand umbilical cord, however, the lifeworlds of truffles are inextricably linked to the sand. The boundary between life and nonlife is blurred.

The sand umbilical cord (fig. 3) allows the truffle to drink the recent rains. If there is drought and it does not rain, there will be no truffles. Mycologists—scientists who study fungi—describe this organism as a hypogenous, globose, mycorrhizal fungi, which means that they live below or partially submerged in the ground, have closed spherical fruiting bodies, and form symbiotic associations with plant roots. They are different from mushrooms in that they fruit underground, do not have stalks, and appear self-enclosed. The “enclosedness” of fruiting bodies, however, is misleading; it is a comparative description of the truffle’s fruiting body, not of the truffle’s relations with other biotic and nonbiotic elements. These fungi bear their spores, their reproductive bits, in the swollen cells of their outer walls. Unlike gilled mushrooms, for instance, they do not have a built-in spore dispersal system. Instead, they rely on human and nonhuman gathering and foraging partners and the wind for dispersal. It is through these relations, among many others, that truffles move about landscapes: they gather

42. Ferdman et al., “Phylogenetic Studies of Terfezia pfeili.”
Figure 3. A truffle with its umbilical cord (photo by Valentine Guenther).
minerals from Kalahari sediments; they are symbiotic partners with plants; and those who gather them, together with the wind, are responsible for dispersing their reproductive capacities. Gathering and being gathered are thus critical aspects of truffle worldings and futures.

But where to find these truffle tracks? Tracks do not stand on their own. Similar to tracking an animal, finding mahupu requires attending to a variety of factors that themselves are shifting and emergent with landscapes. Truffles move in and out of the landscape at a different pace than animals. But they move nonetheless. They are found by gathering the signs that together indicate their arrival in the landscape. These signs exist in different ways and at different scales and become entangled materially in the form of the truffles’ fruiting body. The fruiting body of a truffle is the material manifestation of a coordinated gathering of landscape relations—alive and in motion.

The coordination is not just between plant, fungus, sand, and rain; it also occurs in relation with sunlight and temperature. Such coordination is multidirectional; the presence of mycorrhiza also influences sand composition and plant growth. In this way, truffles do not just arrive in the desert if the right sands and plants happen to be available at the right time; these sands and plants are themselves present in part because of the history of their relations with mycorrhizae. In this way, the truffle can also be said to track: gathering together the conditions of its emergence, long before its fruiting body manifests and leaves a mark on the landscape. Sands, mycorrhizae, and plants are co-constitutive at this scale. They are one open-ended assemblage, or gathering, that hangs together in present landscapes, making future landscapes. How to find truffle tracks, then, requires attending to the various relations that they gather and the communal effects these relations engender. Having now described how truffles gather landscapes, even as they are themselves gathered, I show in the next section how my interlocutors tracked the signs of their potential presence, giving rise to places that are both historical and speculative.

**Staying with the Truffle**

Truffles live in relation to biotic and nonbiotic things that are always on the go, enacting certain movements, patterns, and cycles across varying scales that carry with them the histories of their interactions. They are found by attuning to those they live with. Much as Tsing describes with mushroom picking, tracking truffles makes a “place familiar in the landscape. Familiar places are the beginning of multi-species interaction.”43 Places emerge where truffles have been, are, and may be found: mahupu places, my interlocutors called them.

Truffle places can be historical but also contemporaneous, emergent, and speculative. They have their own social trackways.44 Having learned from my first encounter with truffles in 2009, I returned for a year of fieldwork in the Kalahari Desert in early

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43. Tsing, “Unruly Edges,” 142.

44. Shaw-Williams, “Social Trackways Theory.”
May 2015, just after the late rains at the end of April, in hopes of tracking truffles. This is the time to find mahupu, !Nate and Njoxlau told me: I had arrived at just the right moment. Even in good seasons, truffles can be gathered only intermittently over the course of a few months after late summer rains are followed by cool air, a less than predictable occurrence in this arid semidesert. In addition to the gathering together of the right variety of plant hosts, weather conditions, and soil/sand compositions, they need rain at the right time. The temporality of the rain matters.

I accompanied !Nate and Njoxlau on a tracking survey in the Kgalagadi District for a few weeks, hoping to find truffles along the way. While !Nate and Njoxlau were familiar with this area from past tracking surveys, and had found truffles here before, they did not know of a specific “truffle place.” However, insisting that I had arrived at the right time to find truffles, they showed me how to gather the signs that truffles might appear with, usually indexed by a particular kind of grass, and sometimes but not always near the edge of a pan or a valley. The key for tracking truffles here was knowing both when and where to look. We had to track the truffles’ own material attunement to the spatial, temporal, and material conditions of its emergence. Potential truffle places are tracked by noticing the patterns that afford speculations about truffle potentialities in otherwise not fully familiar places.

As we drove toward the settlement where we would base ourselves for the next week, !Nate and Njoxlau pointed out stands of grass where they thought truffles could potentially gather. These were speculative truffle places. We stopped on several occasions to wander about looking for truffles, but with little luck. Because !Nate and Njoxlau’s main priority at this time was to count tracks for the survey, they suggested we find someone from the settlement to take us to a truffle place.

On our first evening, we met a woman named Boitumelo who told us she knew where to find mahupu. Very kindly, she agreed to take me out the next morning. I met Boitumelo and a few of her relatives early in the morning while !Nate and Njoxlau went to count tracks. Boitumelo’s twelve-year-old daughter Naledi, elder brother K. B., an elderly woman named Brenda, and Boitumelo’s very old aunt joined us as we ventured out (fig. 4). We drove a few kilometers outside the village to a place where they had collected mahupu in previous years. Like most of the surrounding areas, open grasslands with scattered trees characterized the landscape; yet it was not dominated by the sour grass (Kalahariensis schmidtia) that typically lives in the degraded sandy soils common to these parts. Instead, there was more of a white, wispy grass that !Nate and Njoxlau had referred to as “mahupu grass” (Stiptagrosis uniplumis).

Unlike other times when tracking, which often occurred in single file, the group fanned out to look for mahupu. I stayed at Boitumelo’s side to learn from her. When we approached a suitable patch—one that had moist sand, “mahupu grass” stands, morethlwa bushes (Grewia flava)—the party started calling out to one another as they found promising signs. Looking for truffles, they would bend over at the waist, gently sweeping the grass to the side with a stick to inspect the sand for those telltale cracks. At every moment, there was a continuous noticing of the various aspects of the landscape,
an attention to the grasses and other vegetation, the moisture of the sand, and the temperature of the air. To track truffles, we tracked conditions, the relations between them, and how they coordinated: we tracked landscapes. While looking for signs of truffles we also had to be aware of other creatures. Tracks of animals were pointed out and other plants gathered as they were encountered.

Brenda found the first mahupu track underneath a morethlwa bush. She called out for me to dig it out. I was surprised when I arrived at her side because she just stood there, waiting for me to see the crack in the sand, which took me longer than she expected. She did not offer instructions other than to gesture for me to dig it out. As I had years before, I reached into the sand, my fingers still bumbling about, and gently I pulled the humid lump of truffle out of the sand. It was small, but I was quite impressed with myself and dusted it off to show the rest of the group. They laughed at my enthusiasm and simply carried on looking for truffles.

Gatherings are not always cozy; some may interrupt others. A few minutes later, I spotted a truffle track on my own. Again impressed with myself, I called Brenda over to show her. Just as I was about to dig out the truffle, Brenda slapped my hand away, realizing that this was a track of something else. It was purple witchweed (*Striga gesneroides*) (fig. 5), an obligate parasitic plant that emerges from the sand and produces cracks similar to the mahupu’s. As Njoxlau told me later, with regard to witchweed, “If they come out, it means there is mahupu somewhere.”

45. Njoxlau was implying that witchweed and truffles arrive at similar times but that they would not be found in the same place.
the landscape at similar times, though they are quite opposite creatures. While the pathogenic witchweed parasitizes its host plant roots—infesting a variety of African small holder crops, notably tobacco—mahupu enter into mutually beneficial relations with those on which they rely.

Not far away, in the same shrub grove, we found mahupu underneath the edges of the wispy grass tufts. Later, mahupu were found near shrubs. These are both plant species that mycologists have confirmed as host plants for this desert truffle. Boitumelo pointed out the tracks, encouraging me to learn how to dig out the truffles without breaking them or disturbing their umbilical cords, which K. B. described to me as “sand-water.” This little lump of sand and hyphae was moister than the surrounding sand and even the truffle itself, which prompted K. B. to explain that this is the source of gathered water that the emerging fruiting body drinks from.

Tracking truffles brought me to two kinds of places: places known through histories of past doings and speculative places. While the first kind have established trackways, the second sort emerge through encounters with familiar patterns in not-yet-familiar places. These are not places simply because people gather or seek to gather truffles there, but also because of the ways in which truffles themselves gather. That is, place is not a uniquely human category; nonhumans like truffles also perform place through their material relations with others. Through an attention to the patterned coordination of these relations, gathering, like tracking, affords speculative practices about those places and their potentialities.

For people, gathering practices activate a historical intimacy in the emergence of a particular place. A place where truffles have been found and foraged can be a particular truffle place, even as a particular ecological assemblage might indicate a potential truffle place, simultaneously unfamiliar and familiar. Though we did eventually find some mahupu, there were a lot less than was initially anticipated. My tracking partners said that they found a lot of mahupu here two years ago, but on this occasion, Boitumelo and K. B. seemed quite sure that the sand and grass were too dry. This was still a "mahupu place," where past experience and landscape histories converge, despite its relative lack and nonpresence of truffles.

The truffles we found that day were the last I saw during that year of research. While we did not find any more truffles, !Nate, Karoha, and Njoxlau continued to show me how to track them—though in different ways. Tracking truffles, even despite their nonpresence, represents a powerful theory of landscape. A drawing by Njoxlau and Karoha (fig. 6) shows how mahupu live in the sand: it is a speculative representation of a truffle place through time. This drawing presents a bird’s-eye view of a pan with the top layers of substrate removed to reveal a gathering of truffles arriving, or becoming, below the ground’s surface over the course of a few months. To give a rough idea of spatial scale, this might encompass an area somewhere between the size of two and four football fields. Cutting from left to right across the page is a line attached to an oblong shape, which represents a hypothetical pan or valley. The line is a “string,” as my interlocutors called it, connecting all of the truffles to one another. On each side of the string there are additional strings branching off, with little nodes attached to them. The circular nodes are the truffles.

The “strings” connect to the truffles through the “belly button,” Karoha and Njoxlau explained. The little lines radiating out from the truffle nodes are the grass that truffles are often found living with. This is a truffle gathering at the scale of a truffle place in which the truffles form into nodes through relations between truffle strings, plants, and
geological sediments. It is a map of a truffle place, a truffled landscape. In the picture, truffles are material-semiotic entanglements with particular temporal rhythms. They are multitemporal, bringing together gathering practices—in both senses of the coordinated practice of collecting and of coming together—and speculative practices concerning place potentialities.

Frozen in time as an image, it is far from a static depiction of landscape. It shows the movement through time of a whole fruiting season—the temporal accumulation of truffles and their connections from the first signs of fruiting bodies after late summer rains to their last flush. It is not a Cartesian spatial map of an abstract territory, nor does it depict empty or homogenous time. Rather it is a spatiotemporal map in motion. It is a speculative gathering that points to a multiplicity of potential truffle happenings. The truffles are not all there at once. The gathering may remain present and continue to develop, but the fruiting bodies of the truffles—the manifestation of exchanges within these gatherings of relations—are episodic.

In this hypothetical situation, Karoha and Njoxlau explained, gathering truffles would begin in March or whenever the first late-summer rains occur, with the first group of truffles arriving in the top left of the picture. As the gathering season progressed, they would continue collecting on one side of the pan or valley, moving along the upper right side of the page by the end of April, where fresh truffles had just cracked the sand. They would eventually come around the pan, collecting truffles along the way to the bottom left side of the picture when truffles arrived there in July or August. The map is a reflection both of when people gather and the different times at which fruiting bodies arrive in the sands. Truffles gather, they move, and they connect, and human truffle gatherers follow these movements and connections, tracking landscapes.

**To Gather and to Be Gathered: Toward a Carrier Bag Theory of Landscape**

This article stays with the truffle, to paraphrase Haraway, in a serious attempt to story more-than-human landscapes by deploying tracking and gathering as methods and analytics. Doing so has allowed me to think with my interlocutors—trackers, but also scientists, anthropologists, and environmental humanists—in practice, about how truffles are tracked and gathered, and how, as mycorrhizal fungi, truffles themselves track and gather the others they live with. I build on LeGuin’s call to tell the stories of collective relations to argue that thinking tracking through gathering enacts what I am calling a carrier bag theory of landscape. Because this particular organism—the Kalahari truffle—materializes through its entanglement with a variety of other landscape doers, it helps exemplify the ways in which tracking can be a practice of noticing the gatherings of movement that enact landscapes, rather than drawing attention to individual actors moving across a static background landscape.

Truffles need to be located in relation to their ecological assemblages. The patternings of plant gatherings often offer clues. But plants alone are not enough. To find

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47. Haraway, *Staying with the Trouble*. 
mahupu, one must walk the landscape while engaging with all variety of signs. The convergence of a particular set of signs in turn calls for the sweeping aside of grass and brush that may, potentially, reveal a truffle track. Less than signs to be read, these are phenomena to be encountered that reach out into the landscape beyond the tracks themselves. These phenomena carry with them their own stories of interaction that gather attention toward them. In tracking truffles, the temporal pace and scale of a fruiting body's movement in and out of the landscape is much different from those of an animal, but the principles of attending to landscapes while tracking are similar. By attending to the relational spoor of truffles—not the truffles themselves but their lively companions and relations—we tracked truffles as they moved in and out of the landscape in their own right. We tracked the truffle's non-presence as much as gathered its presence. Rather than a practice of hunting down and killing a singular prey, tracking involves the continued noticing, gathering, and responding to assemblages and their movements. Tracking helps tell those gathered stories of landscapes without implying a theory of everything, nor necessarily culminating in a kill. Overall, this approach can help one to understand the contingent relations with which landscapes emerge: the bits and pieces that hang together, parts collected, or dropped out, in an ongoing kind of togetherness in which life and death are not decoupled.

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