

UC Santa Cruz

UC Santa Cruz Previously Published Works

Title

LANDSCAPES AND THROUGHSCAPES IN ITALIAN FOREST WORLDS: Thinking Dramatically about the Anthropocene

Permalink

<https://escholarship.org/uc/item/8741c9rt>

Journal

Cultural Anthropology, 33(3)

ISSN

0886-7356

Author

MATHEWS, ANDREW S

Publication Date

2018

DOI

10.14506/ca33.3.05

Peer reviewed

Abstract

Phenomenological description of landscapes, trees and terraces, oral history and historical ecology find traces of industrialization, plant disease and forest fires in Central Italian forests. Plant form, landscape form, and forest structure can be described through drawings that give resolutely partial descriptions of more-than-human encounters. This kind of knowledge of the landscape is potentially unstable and remade by the details that it contains. By using multiple methods for attending to more-than-human landscapes, we can learn to notice multiple *throughscapes*, landscape patterns that overlap and lie through each other, but which are linked to different histories. Multiplying histories means that rather than being seen as a single era, the Anthropocene can be understood as having many beginnings and coexisting histories that give rise to multiple futures.

Keywords:

Italy, forests, Anthropocene, landscapes

Ghostly Forms and Forest Histories¹

The pine and chestnut forests of the Monti Pisani, only five kilometers south of Lucca, in central Italy, feel very far from the tourist sights of the city center, and from the industrial sprawl of paper, furniture and shoe factories that spreads across the plain. As in many Mediterranean places, mountains and valleys are near each other, but they are in many ways different worlds (Braudel 1972). These are certainly not the landscapes that most people think of when I tell them I am working in northern Tuscany. The few human visitors are mushroom pickers, hunters, the occasional mountain biker, sometimes volunteer fire fighters, or road maintenance crews. Although these forests are often empty of people, they are empty in a particular way; evidence of former human use is omnipresent. This is a place where people, trees, and other nonhumans have been entangled for a very long time. Traces of these past relationships are visible in the forms of trees, of areas of forest, of banks, terrace walls and drainage systems. Through my practices of walking, looking, and wondering, I have been tracing the ghostly forms that have emerged from past encounters between people, plants, animals, and soils. From such practices of wondering, I learn to tell stories about landscape change, which, I argue, suggest a way of engaging with the politics of global environmental change.

These anthropogenic forest histories inspire contemporary environmental politics. The material traces of firewood cutting, tree cultivation, pastoralism, and plant disease are temporal rhythms that inspire projects of tree care or biomass energy production. Each of these projects responds to a different sense of what these forests are, of where they might be going, and of how to act in the face of global environmental change. This multiplicity of pasts and futures can help

us make political sense of the Anthropocene, the contemporary era when almost all ecosystems around the world have been in some measure affected by human activities.² Critics of climate change policy (Hulme 2012), and more recently of the concept of the Anthropocene (Moore 2015), have criticized depoliticized scientific accounts of global environmental change that focus on a single account of the world supposed to inspire political action to protect the environment. Rather than recounting a single history that produced a unified landscape, in what follows I describe overlapping and interwoven “throughscapes” that are linked to multiple histories. From these storylines a different account of Anthropocene politics can emerge.

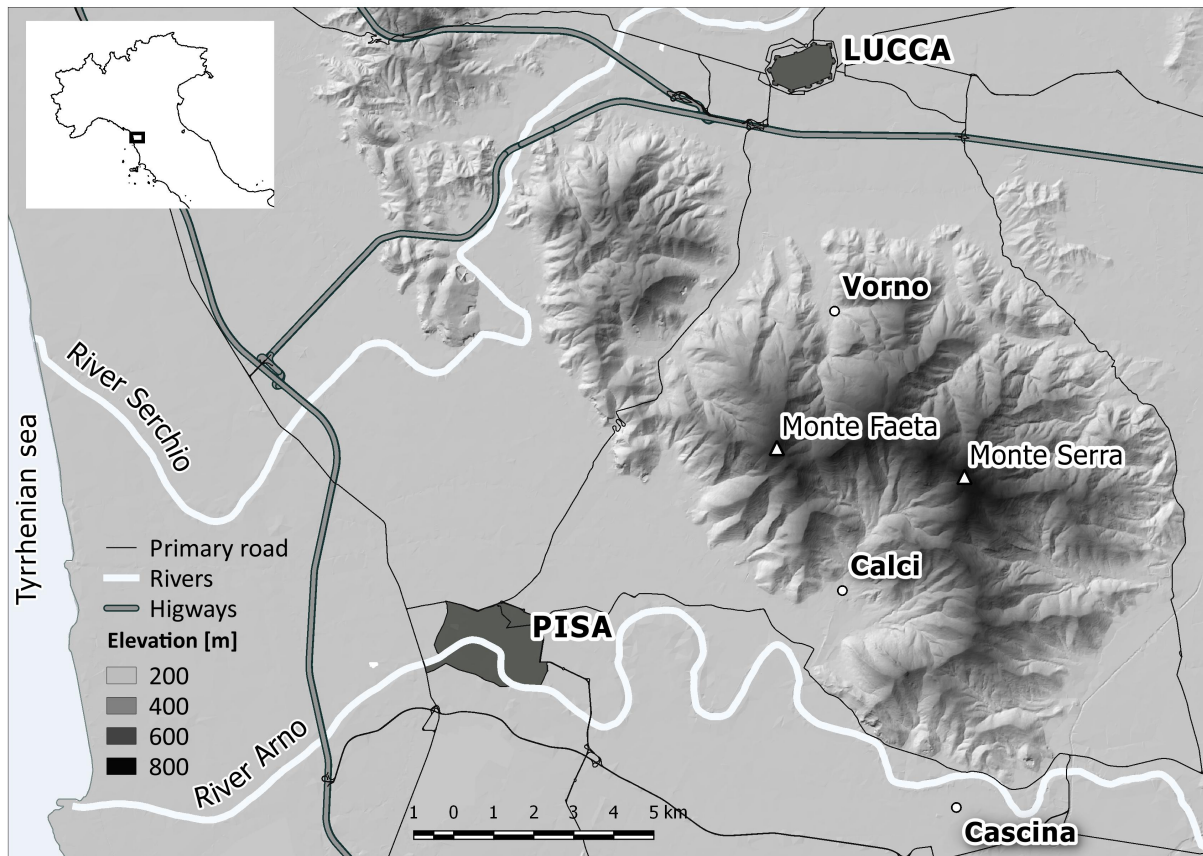
The first history I tell is of the impact of international trade, which moved pathogens around the world and destroyed chestnut cultivation in this area between the mid-19th-century and the 1950s. In this account, the storyline is linked to international trade, to the unintentional journeys of fungal spores and to the capacities of chestnut trees to develop new forms of symbiosis, which halted the advance of some pathogens. The second history starts in the early 1800s, and is one of capitalism and industrialization. Key actors in this account are the peasants³ and shepherds who were transformed into industrial and service workers. Changing forms of agriculture and the gradual transformation of urban metabolisms caused fire-dependent pine trees to spread across these mountains when litter raking, pastoralism, and anthropogenic burning were eliminated. In the present moment, farmers, foresters and others draw upon these histories of transformation and cultivation as they imagine how they might transform parts of the landscape in order to bring into being different environmental futures. These landscapes are simultaneously concrete and material, historical and imaginative. They are linked to multiple histories and rhythms that can help us escape from thinking of nature or history as singular (what John Law calls a “one-world world”: Law 2015, 126). Multiplying our understandings of

possible pasts and futures, and of who might be helped or hurt by these futures, makes the Anthropocene political. The example of the Monti Pisani shows how we can learn to notice multiple coexisting Anthropocenes through mundane practices of walking, of looking and wondering at strange ontologies,⁴ of archival research, oral history, and drawing. These practices are suitable not only for forests, but for thinking through material politics in other parts of the world, from urban parks to river deltas and sewage systems.

Figure 1. Monti Pisani, Lucca in the Background.



Figure 2. Monti Pisani and Italy Location Map



Landscape Facts, Histories, and Ontologies

“Landscape” is a deeply ambiguous term with a rich history. For many scholars landscape was an ideological construct, a canonical standard of elite taste that might support capitalism or state control (Berger 1977; Cosgrove 1985). More recently, Kenneth Olwig has reclaimed a substantive understanding of landscape as “a place of human habitation and environmental interaction” with particular legal, cultural, and economic histories (Olwig 1996, 630). As Anna Tsing points out in *The Mushroom at the End of the World*, landscapes emerge through encounters between people and other beings, including soils, mushrooms and disease organisms (Tsing 2015). In what follows I describe the kinds of landscapes and histories that emerge from encounters between people, trees, soils and terraces in formerly cultivated landscapes in Central

Italy. Perhaps most importantly, this kind of landscape description pushes us to think about how particular forms emerge through encounters, where ontologies are transformed through partial relations between these beings, and where the forms of plants and terraces are clues to the biographies of particular organisms.

At a larger scale, landforms such as terraces and drainage systems tell us histories of human labor and attention to plants, soils and weather. Encounters both with individual organisms and with landscapes press us to explore or rediscover research methods of drawing and natural history. These methods are well suited both to the open ended nature of these encounters and to tracing the forms that result from encounters between people and non-humans (people, sheep, trees), and between non-humans and other non-humans (trees, soils, disease, fire). Such an ethnography of the landscape requires an attention to temporal rhythms of processes as different as rapidly moving fires and slow-growing trees, soil formation, daily cycles of weather and the structural violence of politico-economic transformation and state-formation.

Knowledge of the landscape, with its attention to multiplicity and scalar instability, is a behaves differently from the kinds of knowledge explored by much anthropology of science and STS. Within STS, canonical work has been concerned with how particular facts are stabilized and come to be accepted, such as the scallops described by Michel Callon (Callon 1986) or the pasteurization practices described by Bruno Latour (Latour 1988). Such approaches emerge from studies of laboratory practice and they often describe how a single fact or version of the world is either accepted or rejected in particular locations and before particular audiences. More recent work has pointed to multiple enactments that emerge through practices that link multiple sites (Mol 2002). Knowledge of landscapes is closer to this way of thinking. In particular,

thinking with enactments suggests a kind of surprise, the indeterminacy and slipperiness of what is enacted (Lien and Law 2012). The slipperiness and indeterminacy of what arises from particular encounters with trees and terraces is part of what produces the multiple coexisting and somewhat unstable histories and knowledges of landscape that I describe in this paper.

Knowledge of landscapes contains indeterminacy, texture and a possibility of scale change that is quite alien to the kinds of facts that STS and anthropology have been most concerned with. Such knowledge contains indeterminacy and fields of unresolved texture, smaller details that can become significant and change our understanding of what we take to be larger scales (or vice versa).⁵ This is not just a feature of the landscapes that we ordinarily think of. Come close to a tree, and you will see entire landscapes of relations at every scale, from the pattern of bark that tells you of an ancient tree, to the tiny red fungi that show a tree to be infested by chestnut cancer (farmers notice these spores with fear), or the dry crackled callous that shows that the cancer has itself been infested by a virus that prevents it from killing the tree (chestnut farmers wait breathlessly for such signs of disease stabilization). Come close to look at such details, and your understanding of whether an area of forest landscape is doomed or healthy can radically change. The relations between details and large-scale patterns are always provisional: our changing understanding of a particular detail can change our perception at another scale entirely. I arrive at this kind of knowledge of landscape by moving back and forth between intimate encounters with details of tree form and landscape pattern, between interviews with farmers and visits to archives. As I move back and forth, I gradually come to foreground two histories as being accountable to some of the details, stories and landscape patterns that have come to be significant for me. In this account of how I come to know about a landscape, I do not only interview people or consult archives. My own practices of noticing more-than-human

relations of people, plants, and soils are part of the back-and-forth movement through which I come to settle, provisionally, on the histories and perceptions of landscape that I recount in this essay.

Within the STS tradition, the flourishing scholarship on infrastructure is closest to this way of thinking.⁶ Like landscape, infrastructure engages with distributed patterns of material structures and of the multiple local practices that sustain them. Infrastructures can be (and usually are) multiple, they can lie through each other, and they can be sustained by multiple communities of use, as in Jessica Barnes's account of drainage and irrigation infrastructure in Egypt (Barnes 2014) or Ashley Carse's account of road and canal infrastructures in Panama (Carse 2014). There are important resonances between a more phenomenological approach to infrastructure (Chu 2014) and my own approach to landscape ethnography.

In the forests where I work in Italy, the capacities of particular chestnut trees to resist disease or be grafted to produce fruit have given rise to tended trees, to linguistic classifications of these trees, and to an apparatus of law and property that protects the landscapes that these trees live on. Linguistic terms, practices of care, and the morphologies of trees have constituted a dense empirical field. Words that describe enactments do not capture fully the material and imaginative surprises of the world and are in a perpetually unstable relationship to what they denote. Strange ontologies are present in the mundane and the everyday, from my meetings with shape-changing chestnut trees, to my wondering when I encounter a possibly dead/alive tree stump, to my experience of looking up to notice the landscape pattern of flowering chestnut across a mountaintop. Natasha Myers and Carla Hustak's formulation of involutory momentum draws attention to the processes through I become involved with plants, trees, and terrace, to the "affective push and pull among bodies, including the affinities, ruptures,

enmeshments and repulsions among organisms constantly inventing new ways to live with and alongside each other” (Myers 2012, 97). Trees, diseases, and terraces are relational ontologies (Barad 2003) that compel my attention and make me hesitate in disconcertment as I encounter beings whom I only partially describe. A method that is particularly suited to this experience of noticing the coming into being of perceptions through particular encounters is to use drawings. A line gestures towards what mattered in a particular moment of perception when I noticed a partial relationship, and it explicitly relegates to the background what was not noticed, or was not relevant to that encounter.

In this practice of landscape ethnography, every perception is at once speculative, partial and resolutely empirical. Noticing landscape features, trees or soils takes a double form of wondering (What is this thing that I am in relation with?), but also of wonder, at the mysteriousness and indeterminacy of the world, where our descriptions are always provisional and partial. Timothy Ingold has long argued that material forms emerge from ecological relations in a world of process (Ingold 2011; 2012). I would add that the unending emergence of forms of language and noticing are an important empirical fact about what it feels like to be human in a world of process, where descriptions are never enough, and more words might come to be needed to sharpen our capacity to notice and describe. My own changing sensorium is data for this article, as is the fact that my perceptions are persistent, embodied and yet unstable. Just as the descriptions of a particular organism are partial and tentative, so too landscape descriptions are partial and tentative and inhabited by many details that are not relevant at that level of perception. It is through a principled tacking back and forth between details and patterns that I learn to perceive new patterns and histories.

In a classic article, the feminist geographer Diane Rocheleau draws upon Donna Haraway's concept of situated knowledges to argue for the use of multiple methods in political ecology (Rocheleau 1995). I suggest that we can expand on this insight, to think of our current task as one of linking coexisting processes, histories and ontological transformations that emerge through relations among beings. Drawing on multiple lines of evidence and attending to details of plant and terrace form allow me to notice multiple histories and landscape patterns. These patterns are throughscapes, perceptible landscape patterns that exist in partial relation to each other and overlap with each other, but have different histories, organizations, and temporalities and are always unstable in relation to the details and textures that they only partially contain. As my colleague Anna Tsing pointed out to me on a forest walk, what I was calling throughscapes are also different ontologies that are partially linked to each other. Throughscapes are intensely real, but they are also complex time machines.⁷ These are space-time patternings that I learn to notice through my work of linking sensory curiosity to archive and map, of linking drawings and photographs with fieldnotes from walks and conversations with farmers, biologists and others.

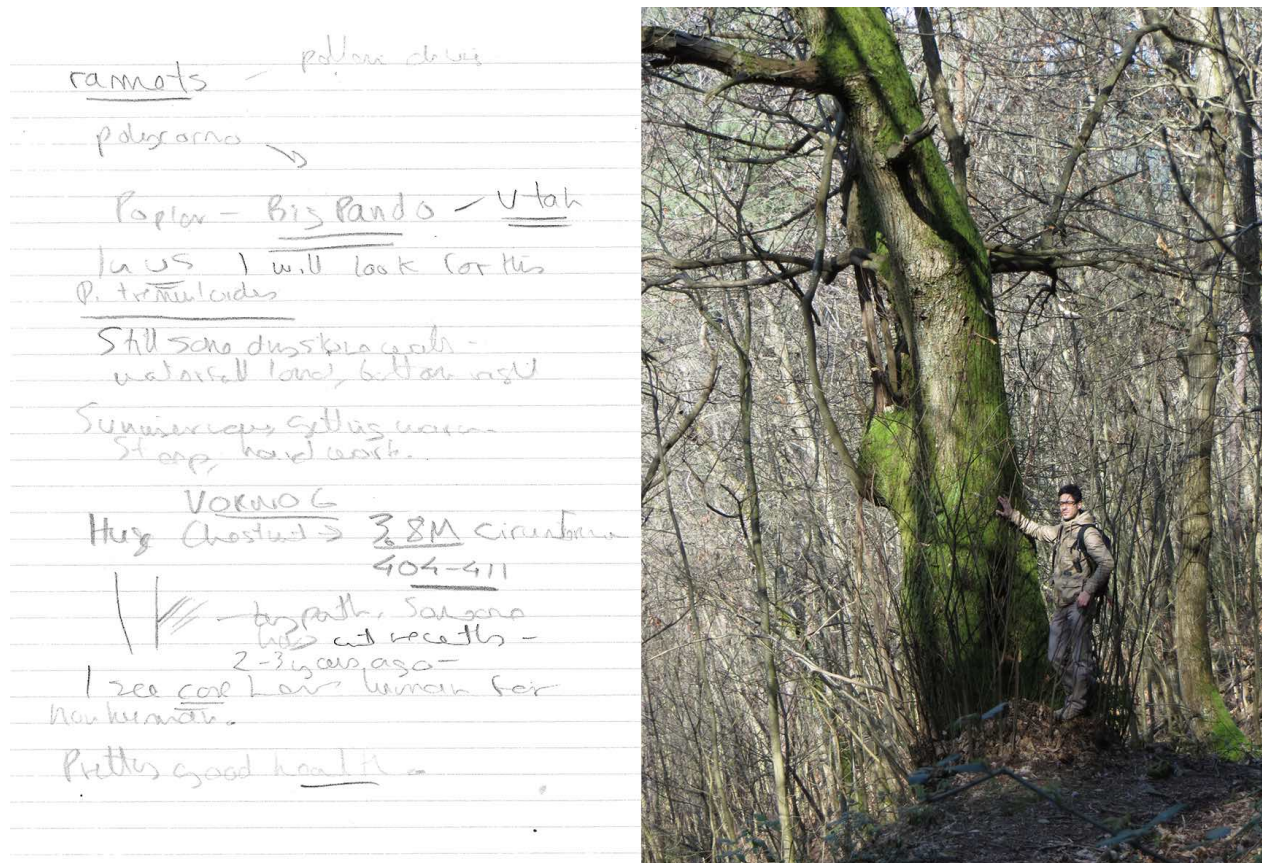
Reading Ghostly Presences in Forests

Walking through the forests of the Monti Pisani with my botanist assistant Francesco Roma-Marzio, I note down what tree, shrub, and understory plant species we see, and what forms they have, jotting these down as sketches in my notebook, making notes of impressions and speculations. As a botanist, Francesco names understory plants for me, and the two of us provoke each other with stories of human use of landscapes. Drawing on my training as a forester, I tell him how the shapes of trees and shrubs tell me stories of tree cutting and regrowth, of fire and grazing. Echoes of conflicts over property and landscape are present in tree form. Remnant

ancient cultivated *castagneti*⁸ (chestnut orchards) tell us of centuries-long relationships with peasant agriculturalists who formerly sculpted chestnut, oak and pine trees into the particular forms that produced food, timber, fodder and fuel, while also providing pasture for sheep and goats (Squatriti 1995; Puccinelli 2010; Giannini and Gabbrielli 2013). Notebooks, interviews, photographs and sketches contain something of my phenomenological experience of encounters with shape changing ancient trees and terrace systems. Perhaps a stump is truly dead, perhaps it may re-sprout and come alive. The figure below shows the first really large cultivated chestnut that Francesco and I had encountered. Note the *polloni* (suckers) sprouting from the base of the tree. We guessed that the size of the *polloni* told us that they had been cut back 5-8 years ago, but based on later experience, I would guess more like 2-3 years

Figure 3. Sample page from field notebook with sketch of giant ancient chestnut tree.

Photograph with Francesco Roma Marzio.

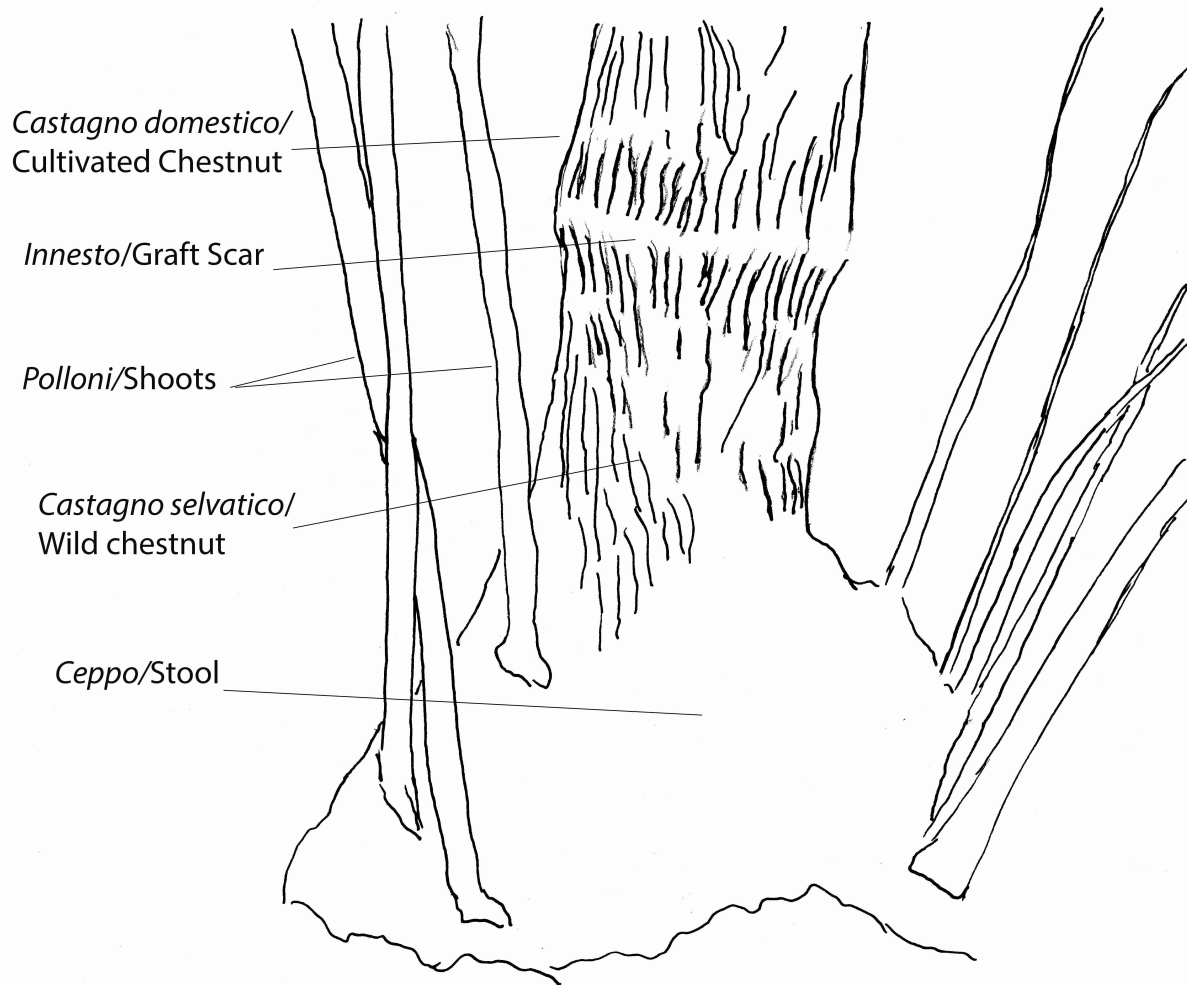


Drawing is the method through which I do justice to this mundane ontological indeterminacy.

The form of a cultivated chestnut tree tells me a story of its responses to encounters with peasants, diseases, fires and soil movement processes. I draw this form in different ways, depending upon whether I notice the details of disease cankers and imagine that this tree is doomed, or on its way to a new symbiosis with disease-causing organisms, when I might notice new shoots and the scarring produced by disease containment. From these encounters I learn to produce a drawing that summarizes my perception of human-plant and plant-non-human

interaction as they come to be manifested in tree form. Sometimes I accompany this drawing with the linguistic terms which sharpen my capacity to notice some differences and not to notice others. My sensory apparatus is transformed by my own curiosity, and by my journeys with farmers and foresters. They teach me words that change my sense of landscape patterns and my capacity to notice tree form. Figure 4, below, comes from a conversation and forest walk with the young farmer Stefano Fazzi. Stefano taught me to see the different bark textures above, below, and around a graft scar, to name the parts of the tree accordingly. Stefano can recognize chestnut varieties on his Apennine hillsides at a glance, which even the most expert botanists cannot always do. Through my encounters with Stefano's trees and stories, my sensory capacities have been permanently changed. I cannot see trees in the same way now, as I learn new words and new ways of noticing texture and form. My capacity to notice is, however, not fully contained or tamed by the words I learn from Stefano, Francesco, or from foresters and scientists. Their words are provisional, they capture some aspect of the indeterminacy and shimmer of strange ontologies, but my perceptions may shift, I might need to tell still other stories, with other words.

Figure 4. Drawing of cultivated chestnut tree/names for parts



Multi-stemmed trees tell me of practices of peasant firewood cutting, known as coppicing (*ceduo*), and of the capacity of these trees to re-sprout from a stump (*ceppo*: see Figure 5 below). Conifer plantations at the top of the mountain tell me of struggles between the Italian state and pastoralists. From the late nineteenth century onwards, but especially during the Fascist regime of Mussolini (1922-1943), the national forest service saw the fires set by pastoralists as a grave threat to the forests. Grazing and pastoral burning were ubiquitous, and in theory, heavily penalized, although in practice widespread and somewhat tolerated. From the late 1940s until the early 1980s, Cold-War and then less militarized national reforestation programs tried to redeem these contested mountain pastures. Throughout this period, foresters saw tall and straight conifer

trees as valuable and scientifically manageable, a way of providing rural employment, producing timber and halting environmental degradation. Later, these plantations were seen as a solution to the rural agricultural abandonment produced by industrialization and urbanization. For Alessandra del Chiaro, the daughter of a peasant smallholder, Douglas fir (*Pseudotsuga menziesii*) plantations near her farm lower down the mountain were a tax boondoggle for rich landowners, an ecological mistake.

Power-laden histories of natural resource extraction and state-making leave traces on tree and landscape form. Even as we notice the details of plant form, my companions and I often discuss history, politics, state-making and global environmental change. Francesco can recognize the multitude of understory plants (I cannot do this): he recognizes native species and notices more recent alien arrivals, leading us to wonder about international trade and transportation networks. When we encounter old pastures covered with conifer plantations, Francesco notices the meadow species *Crocus biflorus*, which is unpalatable to cattle and sheep, hanging on beneath the conifers loved by the forest service. The persistence of these pasture flowers is a trace of the centuries of sheep and goats grazing that would have favored the presence of unpalatable plants and grasses. Stories of sheep, grazing and pastures launch Francesco and me into conversations about the displacement of pastoralists by the forest service. He tells me of the contented outdoor life of his shepherd grandfather in Puglia, who lived into his nineties.

Walking and paying attention to color, shape and form press me to be alert both to textures (the background, which remains indeterminate) and to emergent categories, to the forms that came to matter (the foreground), and which I highlight through sketches and drawings. A few pencil strokes could summarize the patterns that I noticed when I took a picture. These line drawings can be the shapes of trees whose ontology is indeterminate, of field boundaries, or

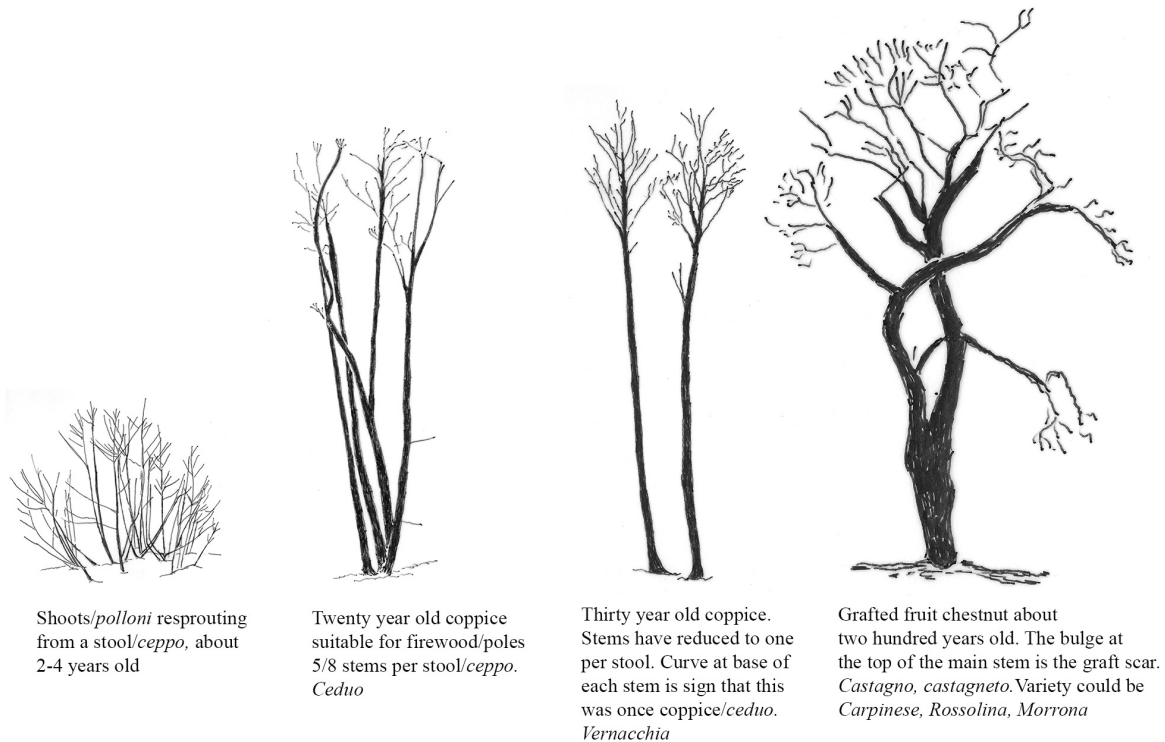
larger landscape patches whose boundaries can be drawn otherwise, perhaps in relation to encounters with details that have come to have a larger significance. In many cases, patterns such as plant form gesture towards processes that I cannot see. A line drawing makes visible my relationship with a particular tree or terrace, and my effort to show that this was a partial relation that failed to grasp other indeterminate aspects of a chestnut stump that might live or die or change shape over the longer term. There is a strong tradition of line drawings in archeology, natural history and field biology (Canfield 2011), and formerly in cultural anthropology (Evans-Pritchard 1940; Lévi-Strauss 1970). Because of the nature of their material, archeologists have never abandoned drawings of changing animal anatomy or seed morphology as an important clue to tracing histories of domestication that tell of human-non-human relationality. Similarly, biologists continue to use drawings to highlight the key features that they are concerned with in telling stories about evolution and adaptation.⁹ Cultural anthropologists, I suggest, might think of line drawing as a method appropriate to recording morphologies that emerge from relationalities across ontological and temporal difference, and to their own involvement with more-than-human beings.

Shape Changers in the Forest

Trees are long-lived shape changers; their form records biographies of survival in the face of fire, disease, grazing, and human cutting, lopping, and pruning. Becoming attuned to tree form is to notice the bizarre inventiveness of plants that change shape and move across the landscape too slowly for us to notice easily. The drawings in Figure 5 make visible some of the different forms that chestnut trees can take.¹⁰ Names for these forms emerged from the daily work of peasant farmers who worked with plant-soil-animal assemblages, and from conversations between

peasant cultivators and the officials and the literati who occasionally talked to them. In Italy a host of traditional technical terms for chestnut trees, terraces, and forests, are now falling into disuse, known mainly to old people, and to historians, foresters and anthropologists like me. Old words tell of old relationships, but new words and plant varieties are also always potentially coming into being from acts of noticing and care. In the winter of 2014, the farmer Stefano Fazzi, who lived in the nearby Garfagnana area, told me that he had noticed that a particular chestnut variety on his land seemed to be immune to the invasive gall wasp *Dryocosmus kuriphilus*, a pest that was devastating chestnut production in the region. Stefano hoped to have his variety recognized and named, and to build collaborations with the academic establishment and the state. This was a speculative anthropocene political project, a way of resisting an invasive disease, and perhaps of adding to his livelihood.

Figure 5. A Menagerie of Chestnut Forms/A Family of Names



These drawings emerged from days of walking across forest landscapes, of learning to notice the strange details that inhabit mundane perceptions, and from many conversations about these landscapes with farmers, officials and others. The drawings come from photographs of particular trees, and are often linked to the moment when I was taught a particular word. *Vernacchia* came to me when walking with the smallholder Francesca del Chiaro, and the plant scientist Massimo Giambastiani (2/18/14). Massimo is a biologist who is concerned to protect traditional chestnut varieties. He showed me ancient chestnut trees in a final state of abandonment, and mourned the loss of traditional cultivated varieties. Francesca’s aged father Giuseppe grows prized chestnut varieties on old olive terraces near their house on the slopes of the mountains. For both of them,

histories of peasant tree care inspire a politics of caring about the shapes of trees, of maintaining plant varieties and of respecting peasant knowledge. The drawing of *ceduo* came to me on a fieldtrip with government foresters, who told me how this multi-stemmed plant might become a tall single-stemmed tree (*ceduo affrancato*)¹¹. Italian foresters love the idea of tall straight trees (ideally conifers), and historically have tried to avoid the gnarled fruit trees or the multi-stemmed firewood forests desired by peasant farmers. Farmers and peasants told me that to allow trees to grow too large was to risk having them classified as high forest (*alto fusto*), which might become bureaucratically impossible to cut, and which might destabilize hillsides and terraces. These drawings are as much concepts as representations then: they contain contested futures, they include my guess at how I can best communicate what I can see (as a forester with a lifelong practice of walking landscapes) or have been taught to see by others. These drawings come from highly atypical photographs where I have removed a tree from its context with other trees; no photograph can communicate what the skilled eye learns to see. Photographs are too realistic, almost the worst way of communicating stories about form. My seeing emerges from walking, talking, touching, and wondering; each drawing is a diagram, a story, a description.

Like tree forms, terracing systems come in many shapes and have many names, these are easier to see in photographs (see Figures 6 and 7 below). Terraces and banks, which keep soil from washing downhill, are forms that emerged from peasant cultivators' attention to plant form, a geomorphological consequence of their attention to plant morphology. When plant roots were washed clean, the plants failed to flourish; peasants responded by building terraces (Mazzarosa 1846, 101). Terracing came into being for many reasons, from capitalist investment to competitive display, but the most important factor was peasant farmers' noticing the capacity of plants to gesture towards soil quality and water availability, processes that humans only dimly

perceive. Terrace and plant form gave rise to a rich vocabulary, to strong affective and aesthetic associations, and to moral judgments. Just as trees have many names for the many forms that have emerged from plant biographies, so too do terraces (Pedreschi, 1963) (see again Figures 6 and 7 below).

Figure 6. Stone terraces (*terrazzamenti, gradoni*), with olive trees. Calci, Lucca, 2016.



Figure 7. Earthen terraces (*cigliani, zolle*). San Andrea del Compito, 2014.



Terrazzamento (terrace) is a relatively recent word. Older and more precise terms are now known to only a few people, as I learned when driving around the Monti Pisani with Fabio Casella. Fabio is a municipal planning official who grew up in a peasant household on the Monti Pisani and whose lifelong passion has been maintaining pastures, terraces and drainage systems (Rizzo et al. 2009). Fabio remembers firewood cutting and sheep grazing, and he names the kinds of terraces as he points them out to me. He reminds me that terraces are also always drainage systems, complex soil-water choreographies that take continual care. Fabio is deeply concerned at the dramatic increase of fires and the expansion of the fire-prone pine species *Pino marittimo* (*Pinus pinaster*) across the Monti Pisani. Stone firebreaks at the edge of old terraces kept fires in check, grazing kept pastures clear of trees that might burn, litter raking made forests

less flammable. For Fabio the repetitive and rather monotonous landscape of pines is a sign of loss and a threat of fire, or of the landslides that might follow fire or terrace abandonment.

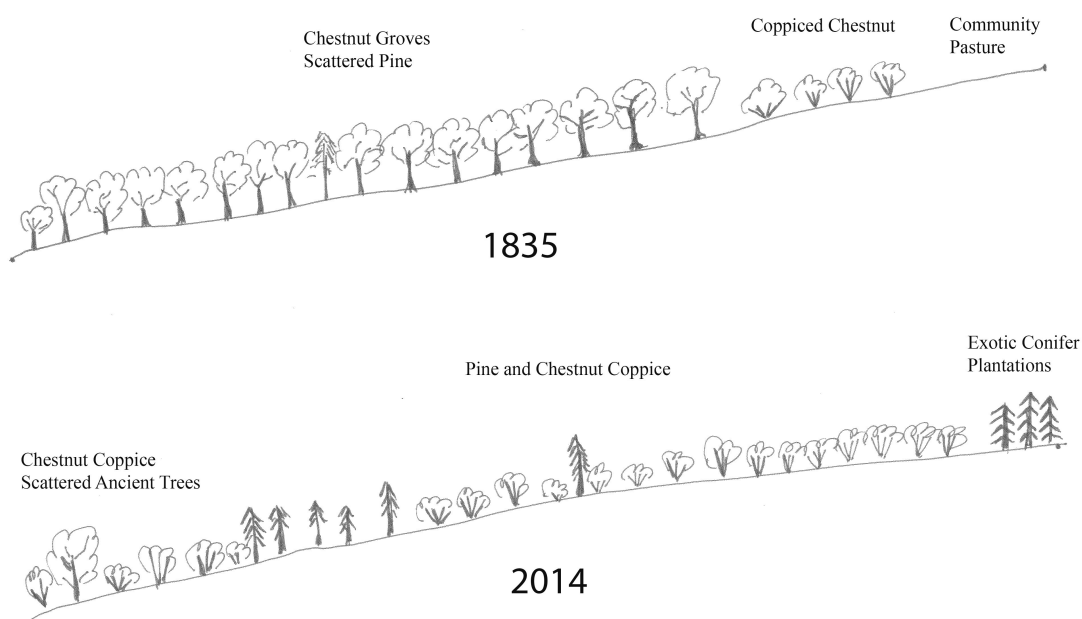
Where pines and chestnut trees mix, he and I both notice the older landscape pattern of *ceduo* or of *castagneto*. Fabio's practices of terrace care are an Anthropocene landscape politics that links the details of terracing systems and grazing to forest fires, landscape stability, and global environmental change.

Historical Ecology: Linking Natural History, Cadastral Maps, Oral Histories

My natural history observations and sketches, drawn from walking across the Monti Pisani, and from conversations with many different companions, gave me a good sense of the present-day forest, haunted by the physical, linguistic and imaginative traces of past cultivation. Early 19th-century cadastral tax maps gave me a very different kind of account, registering traces of encounters between tax collectors, landowners, and peasants who tried to manage multi-species choreographies on these landscapes. Cadastral mapping projects tried to record who owned each piece of land and how the land was being used, with the aim of increasing taxation and propelling capitalist investment in buildings, infrastructure, or improved cultivation. In the tax records I could read traces of encounters between landowners and the peasants who cultivated land on their behalf. We can hear something of the words they shared to talk about complex polycultural cultivation systems, ranging from *chiuse* (walled gardens) cultivated with mixtures of *vigne a pergola* (trellised vines) at the bottom of the valley, to *ceppato di castagno* (coppiced chestnut), *castagneto*, *pascolo* (pasture), and *pineta* (pine forest) (Catasto Vecchio 1843). These descriptions emerged from a meeting between the tax assessor, who was also usually a local landowner (Massoni 1999, 255-256), and the estate manager, peasant share-cropper or small

farmer who managed the land. These records preserve traces of an intimate relationship between plant mixtures and the peasant managers who described them, and between these peasants and landowner-tax assessors who estimated the value of crops. Drawing upon this tax register, I can compare the forms of plant cultivation in 1843 with what I saw during my walks in 2014.

FIGURE 8. Comparing forests in 1843 and 2014. Dominant tree forms on a transect walk from Cima di Vorno to Monte Faeta, Lucca, Italy (172 to 846 meters elevation).



This drawing is an empirical diagram resulting from my walks and conversations with Francesco, to interviews with foresters, farmers, and officials,¹² and to visits to the Archivio di Stato in Lucca. This drawing records histories of ruination, disastrous pathogen outbreaks and the slower disaster of capitalism. In 1843 the landscape was dominated by *castagneto* with some

pineta, a smaller area of *ceduo* managed for firewood, and a communal pasture at the top of the mountain. In 2014 the *castagneto* is almost entirely gone, *pino marittimo* occupies many areas and chestnut *ceduo* covers most of the rest. At the top of the mountain exotic conifer plantations (*Pinus nigra*, *Cedrus libani*) have replaced the former common pasture. In many sections, *pino marittimo* has completely taken over, with scrubby stumps of ancient chestnuts lingering in an understory dominated by bracken (*Pteridium aquilinum*) with occasional manna ash (*Fraxinus Ornica*), arbutus (*Arbutus unedo*) and, on drier and higher areas, drought-adapted species (*Juniperus* and *Ulex*). Often Francesco and I would see ruined *metati* (chestnut smoking sheds) and abandoned terraces in areas now covered by pine forest. The conifer plantations at the top of the mountain are the last echo of Cold-War workfare programs that sought to prevent peasants from becoming communists. Old people tell of the fines that the forest service used to impose on pastoralists, of the hard work of planting trees. Some of the *ceduo* is still cut for domestic firewood, but much is destined to become woodchips for biomass energy production, an effort to stave off the slow disaster of climate change.

Seeing Throughscapes: Ink Disease, Industrialization and Forest Fires

Plant forms emerge as a result of biographies of individuals and their histories of encounter with other beings: firewood cutters, fires, or epidemic pathogens. By walking across many parts of the landscape my encounters with individual organisms taught me to perceive larger-scale landscape patterns and to wonder about the causal forces that brought these patterns into being. I will briefly describe two throughscapes, landscape patterns which literally overlap and sit through each other.

History 1: Ink Disease. Cutting Peasant-Sheep-Chestnut Assemblages

The scattered ancient chestnut stumps with emerging sprouts are the survivors of the pathogen *Phytophthora cambivora*, which arrived here in the 1850s and destroyed low-elevation chestnut orchards, leaving only a few scattered surviving trees. Plant scientists and peasants told me that *Phytophthora* kills trees completely dead in a matter of weeks, striking like a *fulmine* (lightning bolt) and killing trees down to the roots. Affected chestnut trees produced a foul-smelling black liquid in their roots, giving rise to the name *male del inchiostro* (ink disease), causing wholesale abandonment of chestnut cultivation at lower elevations (Bonucelli 1939; Cipolloni 1893; Gibelli 1883) and allowing other tree species (not only *pino marittimo*) to colonize the landscape. By the 1930s the *male del inchiostro* had declined in virulence, perhaps as the ectomycorrhizal associates of trees learned to form less destructive associations with it (Blom et al. 2009). Chestnut *ceduo* and *castagneto* persisted at higher elevations where the pathogen did not strike. The spread of *Phytophthora* around the world in the 1840s can be attributed to the unintended impacts of 19th-century international trade, whose road networks and ports enabled the journeys of pathogens. In this account, peasants, trees and soils, ectomycorrhizae and *Phytophthora* are key actors who mutually transformed each other in unexpected ways. It would be easy to tell a history of invasive disease destroying an agro-ecological system, beginning with the arrival of the ink disease in the 1850s and ending on a note of cautious optimism inspired by the remnant chestnut trees clinging to the upper slopes of the Monti Pisani. This is certainly part of the story; it captures some part of the relations among people, trees, soils and *Phytophthora*. This storyline is accountable to the remnant low-elevation chestnut trees loved by Massimo and Alessandra, to the much larger areas of *castagneto* recorded in the tax registers, and to the ruined *metati* scattered across the landscape. This storyline, however, is partial: in highlighting the material

traces and absences produced by chestnut disease and international trade, it fails to notice a completely different pattern of presence and absence.

History 2: Industrialization and Wildfire. Cutting Peasant-Sheep-Leaf-litter Assemblages

A different history starts fifty years earlier, around 1800, and is linked to capitalism and industrialization. This history tells of the disaggregation of urban metabolism from the forests that formerly supplied fuel and fertilizer. It tells of the transformation from sharecropping peasants—whose care of sheep linked forest leaf-litter raking with fields, whose firewood cutting and charcoal burning supplied home heating—into industrial and now postindustrial workers. Already in the early 1800s, many people in Vorno, as in other towns around the Monti Pisani, were working in the flour, paper, paint and gunpowder mills that clustered along the streams that ran down from the mountains (Massoni 1999). By the 1860s, this water-powered industrialization was in full swing and was not displaced until the arrival of oil-powered industrialization after World War II.¹³ From the 1950s onward the breakup of large estates on the lower slopes of the Monti Pisani allowed some sharecroppers to buy their land and become small farmers; others worked in factories. The next generation is increasingly one of postindustrial workers or workers in rural tourism. Some of them maintain gardens or cut firewood, but sheep grazing and litter-raking have completely disappeared from the Monti Pisani. This absence also produces material presences: thick litter layers on forest floors, fire scars, burn areas, fire roads cut by volunteer firefighters or the forest service. This history tells of the long struggle of sharecroppers to scrape a living out of difficult soils in the face of sometimes oppressive landlords, of how some of these sharecroppers became smallholders (like Francesca's father), while others emigrated to cities or became industrial workers or officials (like Fabio Casella).

This history, of capitalism dissolving peasant labor practices, which had linked trees, sheep, grass and landscape form, has various conjunctures and moments of rapid change. Perhaps the most telling conjuncture for this particular landscape was the shift from animal-plant fertilizer to chemical fertilizer.¹⁴ Until the 1960s, peasants used to rake leaf litter in the forests and carry this downhill to terraces, where it was combined with animal dung to become valued fertilizer.¹⁵ One old farmer told me how the color of an entire hillside had changed from the red of his youth to the present-day green, as the backbreaking work of carrying baskets of leaf litter disappeared into memory. Younger volunteer fire fighters told me how large-scale forest fires arrived in the mid-1970s, about fifteen years after the abandonment of sheep grazing and litter raking. Casella had collaborated with a fire scientist to experiment with restoring burning to the crest of the mountains in an effort to reduce at least the size and intensity of wildfires, which had caused the expansion of fire-adapted *pino marittimo*. This second landscape pattern, of the rather monotonous pine forest that dominates lower and medium elevations, especially on the southern side of the mountains, is accountable not to stories of disease and global trade, but to labor practices in fields and factories, to urban metabolism, and to the former linkages among sheep, fertilizer, leaf litter and labor. When Casella points to the deep leaf litter that makes forests flammable, he teaches me also to notice absences: of sheep, goats and of the peasants who worked with them. A final force for landscape transformation linked to industrialization is a second disease, the chestnut cancer (*Chryphonectria parasitica*), which arrived in this area in the 1950s. Faced with this new pathogen, many farmers decided to sell the remnant higher-elevation chestnut groves that had survived the *male del inchiostro* to nearby tannin factories that literally devoured ancient trees. Like the ink disease, chestnut cancer was eventually slowed down by its own accumulation of relationships with other beings. In this case, the cancer acquired its own

virus, which made it no longer lethal. Logging for tannin production did not kill trees, but it transformed remaining chestnut orchards into *ceduo*.

In Figures 9 and 10 you can see something of what I learned to see through my close encounters with pines and chestnuts and through my conversations with companions who taught me words that had emerged from practices of care and cultivation. From these encounters, I am pressed to see two different, provisionally stable throughscapes that lie through each other. By being near and close to particular trees, I learned to see color and texture, so that a few days later, when I looked back at the Monti Pisani, my eyes were attuned to the particular reddish color of chestnut buds (light gray), the gray-blue of *pino marittimo* (dark gray) (Figure 9). As you can see, light and dark gray are mixed, but two landscape patterns are clearly visible, even as these patterns literally mix and lie through each other. My encounters with farmers and archives, my walking and noticing, had helped me perceive different patterns and histories. The pattern of remnant chestnut forest dominated by ancient trees and living stumps is linked to histories of international trade, peasant tree care, plant disease and emerging symbioses between pathogens, plants, and microorganisms. The areas of pine forest are linked to the absence of sheep and of peasants who formerly raked leaf litter, to the recent forest fires which help young pines expand across the landscape. There is a continuous cross-talk between my close encounters with particular trees or ruins and my large-scale experiences of landscape patterns. By tacking back and forth between farmers and officials, between visits to the archive and walking, noticing and speculating, I come up with storylines that are linked to my perception of throughscapes, patterns that contain multiplicities and mixtures. Throughscapes overlap and lie through each other, they organize perception and anchor histories, but they are also somewhat provisional. The drawing in

Figure 10 below could be redrawn in many ways: the lines are both perceptions and concepts that give rise to theories.

Figure 9. Detail from photograph of Monti Pisani (by author) Pine (dark grey) and Chestnut (light grey).

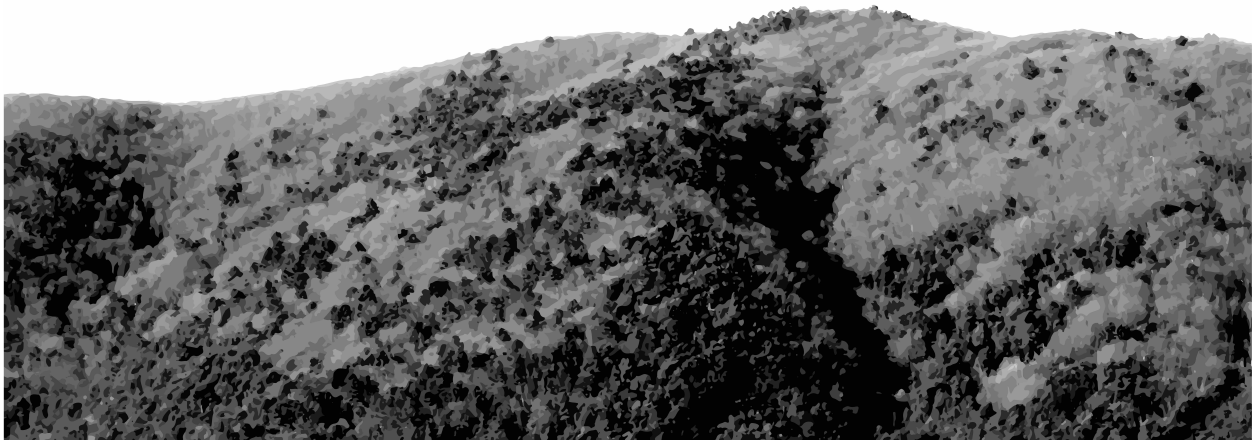
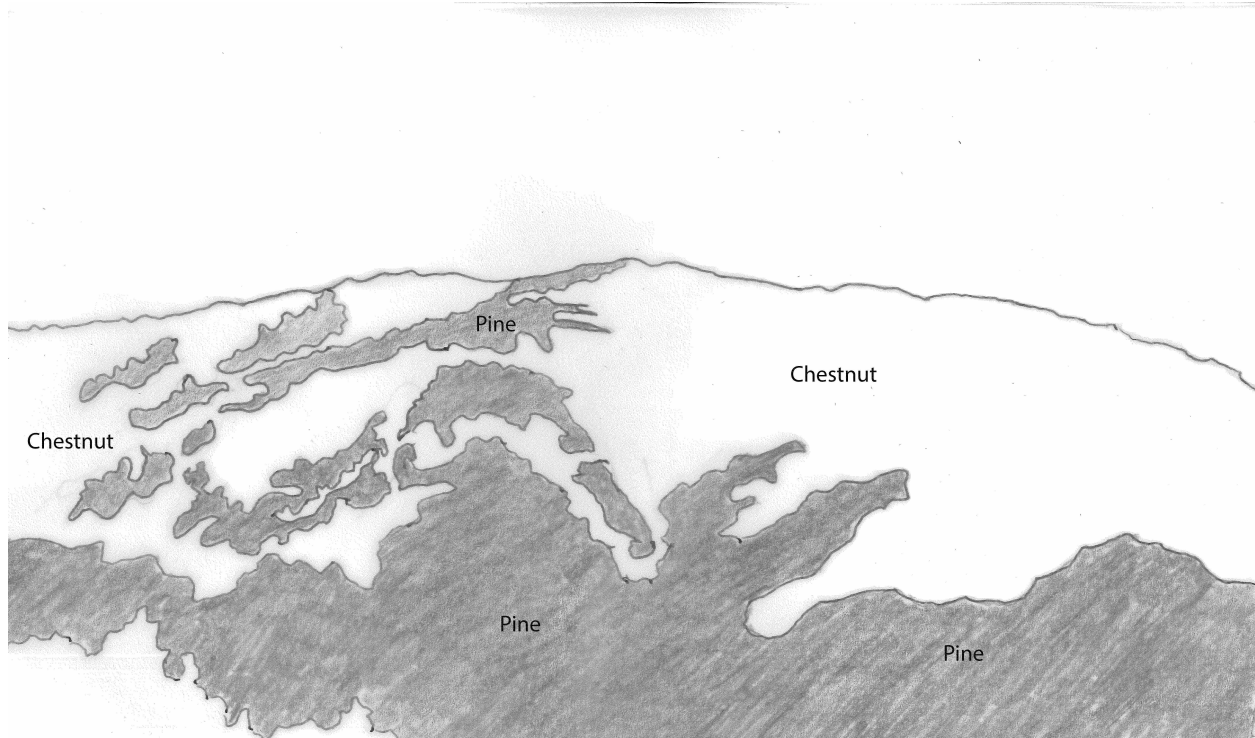


Figure 10. Chestnut and pine throughscapes on Monti Pisani. Drawing by author.



Conclusions

In this paper I have described how I use methods drawn from natural history, oral history, landscape walks and interviews, and archival research, as well as from my own phenomenological experience of walking and noticing, to recount multiple histories of landscape change. These histories proceed at different rates, in relation to different causes, and have produced different landscape patterns in the present. I have suggested that reading landscape in this way makes visible multiple throughscapes, landscape patterns that lie through each other, are partially connected to each other, but are structured by particular human-non-human relations and proceed according to their own rhythms. As my colleague Anna Tsing pointed out to me, throughscapes are different ontologies and infrastructures that coexist with one another even if they have different histories. One throughscape is the rapidly changing post-peasant landscape of pine and fire, which is strongly linked to histories of capitalism and industrialization. The other

is a much slower changing post-disease chestnut landscape linked to longer histories of biological exchange and international trade. These throughscapes have considerable consistency of species composition and tree form; this repetitiveness could allow us to think of them as a kind of infrastructure (Carse 2014).

Much discussion of ontologies in recent anthropological debates has highlighted the incommensurability of radically different ontologies and temporalities, as in Marisol de la Cadena's work on Andean earth beings, which lie outside of history and are rendered unthinkable by the state (de la Cadena 2010). Something like this non-communication between ontologies took place in Italian forestry officials' attachment to conifer plantations and hostility to the pastoralism and the burning that formerly produced fire-resistant pastoral landscapes across the Mediterranean (Cevasco and Moreno 2013). Maintaining this kind of incommensurability takes ongoing political work (Dove 1983; Mathews 2005). In the account I give here, however, I point not to incommensurability across political-ontological differences, but to the mundane practices through which I learned to perceive multiple ontologies, histories, and the throughscapes that I could perceive at the same time. Analogous methods could be used to notice multiple coexisting throughscapes in other places entirely, from urban spaces to industrial farms.

Each throughscape has a different storyline, a history with a different beginning, different actors that change as a result of relationships with each other, and with spatial patterns that emerge differently at different scales. These throughscapes are not linked to a single history, but to multiple histories, which emerge from my practice of attending to processes that proceed with very different rhythms, from rapidly moving fires to slower moving diseases and symbioses. Landscapes are an interesting kind of thing here: they are quasi-objects, perceptual categories

inhabited by a multiplicity of relations between living and non-living beings, but they are also phenomenologically real; they have a certain color and texture and an instantly recognizable form, a repeated infrastructural pattern of abandoned chestnut groves or of fire-blasted pine forests. Landscape patches are approximate, containing shifting assemblages of humans and non-humans (Tsing 2015, 394). At the same time they are concrete, recognizable, and linked to political and economic formations and histories (Olwig 1996).

In the account I have given of the Monti Pisani, histories and ontologies are multiple. Each history is partial, we can simultaneously entertain multiple histories and the provisionally stable landscape patterns which I have linked them to. These histories emerge from my practice of tacking back and forth between forest walks, scarred trees, conversations with farmers and visits to the archive. Unlike the classic facts of STS, which are stabilized by assenting witnesses and stabilizing networks, or whose difference emerges through site-specific practices (Mol 2002), this kind of knowledge of the landscape is inherently multiple across the same landscape, and is always potentially unstable when details come to tell stories at other scales. In the Monti Pisani, knowledge of the landscape of large-scale patterns of ancient chestnut orchards is always potentially remade by small patterns on individual trees, such as disease or graft scars. A dying tree can change my understanding of a whole landscape; my sudden perception of blocks of conifer plantations may make me ask farmers and archives about these state-sponsored interventions. Just as every drawing is a form that contains indeterminacy and multiplicity, so too my histories coexist with other histories and rhythms, possible patterns that are both empirically real and provisional, containing details that could change perceptions of patterns at other scales.

Ethnoecologists and scholars of traditional and indigenous ecological knowledge have long described the existence of rich domains of classification in areas of particular interest and

practical work, as in Evans Pritchard's work on cattle (Evans-Pritchard 1940) or Conklin's work on Hanunó'o farmers (Conklin 1986, 1957). Other scholars have described how cultigens and the memories of their use are retained or lost (Nazarea 2006). In this paper the historical depth of my evidence has allowed me to trace the emergence and disappearance of particular forms of noticing and linguistic description, as changing work practices cause words for tree form, terraces, or plant varieties to emerge or recede from common knowledge. These processes of emergence and disappearance resonate with the incomplete descriptions through which I learned to see and draw tree form and landscape pattern in the Monti Pisani. Descriptions and classifications are always partial, both grasping and failing to grasp the world. Involuntary encounters with particular beings literally draw my interlocutors and me in.¹⁶ These encounters sometimes demand particular words to refer to plant forms or landscape patterns, across local communities of practice or bureaucratic state-making. These plant forms are always partial, containing indeterminacy alongside what is resolved and perceived.

In the Monti Pisani, different Anthropocenes inspire projects of landscape restoration that draw upon specific landscape histories to craft speculative, hopeful, and deeply political imagined futures. Volunteer fire fighters, inspired by their retelling of the impacts of the abandonment of pastoralism and litter raking, now talk of restoring burning to the crests of the Monti Pisani. Another Anthropocene politics is advocated by the biologist Massimo Giambastiani, who seeks to preserve low-elevation chestnut varieties that will be more resilient in the face of climate change. Opponents of large biomass electricity plants in nearby Bagni di Lucca draw upon the charisma and legitimacy of peasant firewood cutters to demand energy systems that feed local uses of heat energy rather than to large biomass energy plants that will power the national electricity grid. In each case, the historic forms and uses of the landscape

animate future-oriented politics. Each of these Anthropocene political projects draws upon histories of peasant experimentation and landscape use, none tries to reproduce the past, each seeks to make a livable present or prepare for future disaster. Similarly, the political ecologies that have arisen in response to imperial and postcolonial projects of landscape transformation in the global south have always been political responses to one or another Anthropocene. These political ecologies are not a depoliticized and singular managerial Anthropocene, but multiple, deeply political Anthropocenes that are linked to different landscape histories and futures.

In recent years there has been a heated debate about when to date the Anthropocene. Scholars have argued over whether the best date is the Colombian exchange (when old- and new-world plants, animals and diseases met each other), the Neolithic origins of agriculture, the industrial revolution, or the 1945 atomic bomb test in New Mexico (Swanson 2017). A related discussion carried out mainly by humanists has focused on the risks and dangers of particular namings, asking whether the term Anthropocene inappropriately highlights the power and imagination of humans, or of particular humans, or if perhaps it silences the role of capitalism (Haraway 2016). These debates are valuable, but I argue that an attention to landscapes and phenomenologies of encounter draws our attention not to a singular Anthropocene, but to multiple Anthropocenes, which coexist with each other. We can think of these Anthropocenes as having multiple beginnings and storylines, each of which leaves much unseen. We can cultivate a dramatic form of attention that sustains multiple, competing stories of social and ecological change, of encounters between people, plants, soils and diseases, while remaining alert to the limits of each account, to the excess that it fails to capture. Ecological modelers, earth-systems scientists and their humanist critics have been too hasty to assume that the Anthropocene is one process, and that it must begin at one particular time. If we are willing to notice multiple

Anthropocene temporal rhythms and overlapping throughscapes, we are closer to the kinds of events that multiple histories tell us. Each history (like each ecological model) captures some aspect of the irreducible complexity of the world, each history follows the transformations and relations of particular beings while paying less attention to others, each ecological model is a partial account that encounters irreducible indeterminacy. Dramatic modes of attention are good to think with here. When we watch a play, we are able to imagine that each character has a point of view, and we are willing to be entertained by a wholly unrealistic situation. Drama requires and makes visible the imagination of the audience; it stages a multiplicity of coherent but partial worldviews, without demanding that the viewer choose one character as having the right vision of the world. In telling accounts of Anthropocene landscapes in Italy, I have drawn from the histories and biographies of particular plants, pathogens or economic systems. I have laid out a partial but coherent account of several among many Anthropocenes, while allowing myself to entertain still other Anthropocene dramas.

References Cited

- Anand, Nikhil. 2015. "Leaky States: Water Audits, Ignorance, and the Politics of Infrastructure." *Public Culture* 27 (2 76):305-330. doi: 10.1215/08992363-2841880.
- Armiero, Marco. 2011. *A rugged nation : mountains and the making of modern Italy : nineteenth and twentieth centuries*. Cambridge [UK]: White Horse.
- Barca, Stefania. 2010. *Enclosing water : nature and political economy in a Mediterranean valley, 1796-1916*. Cambridge: White Horse Press.
- Barnes, Jessica Emily. 2014. *Cultivating the Nile: the Everyday Politics of Water in Egypt, New Ecologies for the Twenty First Century.*: Duke University Press.
- Berger, John. 1977. *Ways of seeing*. Vol. 165 pages .:
- Bessire, Lucas, and David Bond. 2014. "Ontological anthropology and the deferral of critique." *American Ethnologist* 41 (3):440-456. doi: 10.1111/amet.12083.
- Blaser, Mario. 2014. "Ontology and indigeneity: on the political ontology of heterogeneous assemblages." *Cultural Geographies* 21 (1):49-58.
- Blom, Jan Maarten, Andrea Vannini, Anna Maria Vettraino, Michael D. Hale, and Douglas L. Godbold. 2009. "Ectomycorrhizal community structure in a healthy and a Phytophthora-infected chestnut (*Castanea sativa* Mill.) stand in central Italy." *Mycorrhiza* 20 (1):25-38. doi: 10.1007/s00572-009-0256-z.
- Bonucelli, Pio Fortunato. 1939. "Il Castagno Nella Lucchesia." *Reale Accademia Lucchese di Scienze, Lettere ed Arti*. (1939-XVII):2-26.
- Callon, Michel. 1986. "Some Elements of a Sociology of Translation: Domestication of the Scallops and the Fishermen of St. Briec Bay." In *Power, Action, and Belief: A New*

- Sociology of Knowledge?*, edited by John Law, 196-233. London, Boston and Henley: Routedge and Kegan Paul.
- Canfield, Michael R., ed. 2011. *Fieldnotes On Science and Nature*: Harvard University Press.
- Carse, Ashley. 2014. *Beyond the big ditch : politics, ecology, and infrastructure at the Panama Canal*. Vol. xv, 298 pages :. Cambridge, Massachusetts: MIT Press.
- Catasto Vecchio. 1843. *Giornale di Campagna*,. Archivio di Stato di Lucca.
- Cevasco, Roberta, and Diego Moreno. 2013. "Rural Landscapes: The Historical Roots of Biodiversity." In *Italian Historical Rural Landscapes*, edited by Mauro Agnoletti, 141-152. Springer Netherlands.
- Chu, Julie Y. 2014. "When infrastructures attack: The workings of disrepair in China." *American Ethnologist* 41 (2):351-367. doi: 10.1111/amet.12080.
- Cipolloni, Francesco. 1893. "La Decadenza del Bosco Nei Monti Pisani: E Modi Pratici di Provvedervi." *L'Agricoltura Italiana Serie Seconda- Vol 9*:132-137.
- Conklin, Harold C. 1957. *Hanunó'o agriculture: A report on an integral system of shifting cultivation in the Philippines*. Rome: FAO.
- Conklin, Harold C. 1986. " Hanunó'o Color Categories." *Journal of Anthropological Research* 42 (3):441-446. doi: 10.2307/3630047.
- Cosgrove, Denis. 1985. "Prospect, Perspective and the Evolution of the Landscape Idea." *Transactions of the Institute of British Geographers* 10 (1):45-62. doi: 10.2307/622249.
- Crutzen, Paul. 2002. "Geology of mankind." *Nature* 415 (3, January 2002):23.
- De La Cadena, Marisol. 2010. "Indigenous Cosmpolitics in the Andes: Conceptual Reflections beyond "Politics". " *Cultural Anthropology* 25 (2):334-370.

- Dove, M. 1983. "Theories of swidden agriculture and the political economy of ignorance." *Agroforestry Systems* 1 (2):85-99.
- Evans-Pritchard, E.E. 1940. *The Nuer: a description of the modes of livelihood and political institutions of a Nilotic people*. New York and Oxford: Oxford University Press.
- Edwards, Paul N. 2010 *A vast machine computer models, climate data, and the politics of global warming*. Cambridge, Mass. :: MIT Press.
- Gan, Elaine. 2017 (In Press). "An Unintended Race: Miracle Rice and the Green Revolution." *Environmental Philosophy*.
- Gibelli, Giuseppe. 1883. *Nuovi Studi Sulla Malattia del Castagno, Detta Dell'Inchiostro. Memoria*. Bologna: Tipografia Gamberini e Parmeggiani.
- Gimmi, Urs, Benjamin Poulter, Annett Wolf, Hanspeter Portner, Pascale Weber, and Matthias Bürgi. 2013. "Soil carbon pools in Swiss forests show legacy effects from historic forest litter raking." *Landscape Ecology* 28 (5):835-846. doi: 10.1007/s10980-012-9778-4.
- Grove, A.T., and A.T. Rackham. 2001. *The nature of Mediterranean Europe: an Ecological History*. New Haven and London: Yale University Press.
- Haraway, Donna. 1991. "Situated Knowledges: The Science Question in Feminism and the Privilege of Partial Perspective." In *Simians, Cyborgs and Women.*, 183-201. New York: Routledge.
- Haraway, Donna. 2008. *When Species Meet*. Minneapolis: University of Minnesota Press.
- Haraway, Donna. 2016. "Tentacular Thinking: Anthropocene, Capitalocene, Chthulucene." *e-flux Journal* #75 (September).

- Hulme, Mike. 2012. "What sorts of knowledge for what sort of politics?. Science climate change and the challenges of democracy." *3S Working Paper 2012-15*. Norwich, UK: Society and Sustainability Research Group.
- Ingold, Tim. 2011. "Materials Against Materiality." In *Being Alive*. Oxford, New York: Routledge.
- Ingold, Tim. 2012. "Toward an Ecology of Materials." *Annual Review of Anthropology* 41 (1):null. doi: doi:10.1146/annurev-anthro-081309-145920.
- Larkin, Brian. 2013. "The Politics and Poetics of Infrastructure." *Annual Review of Anthropology* 42.
- Latour, Bruno. 1988. *The pasteurization of France*. Vol. 273 p. ;. Cambridge, Mass. :: Harvard University Press.
- Law, John. 2015. "What's wrong with a one-world world?" *Distinktion: Journal of Social Theory* 16 (1):126-139. doi: 10.1080/1600910X.2015.1020066.
- Law, John, and Marianne Lien. 2012. "Slippery: Field Notes on Empirical Ontology." *Social Studies of Science*. doi: 10.1177/0306312712456947.
- Lévi-Strauss, Claude. 1970. *Tristes tropiques*. Vol. 404 p. New York: Atheneum.
- Moore, Jason W. 2015. *Capitalism in the web of life : ecology and the accumulation of capital*. Volume xi, 316 pages; London: Verso.
- Lien, Marianne Elisabeth, and John Law. 2012. "Emergent Aliens: On Salmon, Nature and Their Enactment." *Ethnos (in press)*.
- Massoni, Giovanni. 1999. *La Pieve e la Comunità Di Vorno*: Maria Pacini Fazzi Editori.
- Mathews, Andrew Salvador. 2005. "Power/Knowledge, Power/Ignorance: Forest Fires and the State in Mexico." *Human Ecology* 33 (No. 6, December):795 - 820.

- Mazzarosa, Antonio. 1846. *Le Pratiche della Campagna Lucchese*. Lucca: Tipografia di Giuseppe Giusti.
- Mol, Annemarie. 2002. *The Body Multiple: Ontology in Medical Practice*: Duke.
- Myers, Natasha. 2012. "Involutionary Momentum: Affective Ecologies and the Sciences of Plant/Insect Encounters." *Difference* 23 (5).
- Nazarea, Virginia D. 2006. "Local Knowledge and Memory in Biodiversity Conservation." *Annual Review of Anthropology* 35 (1):317-335. doi: 10.1146/annurev.anthro.35.081705.123252.
- Olwig, Kenneth R. 1996. "Recovering the Substantive Nature of Landscape." *Annals of the Association of American Geographers* 86 (4):630-653. doi: 10.1111/j.1467-8306.1996.tb01770.x.
- Pedreschi, Luigi. 1963. *I Terrazzamenti Agrari in Val di Serchio*., *Publicazioni Dell Istituto di Geografia Dell'Universita di Pisa*. Pisa: Libreria Goliardica.
- Pezzi, Giovanna, Giorgio Maresi, Marco Conedera, and Carlo Ferrari. 2011. "Woody species composition of chestnut stands in the Northern Apennines: the result of 200 years of changes in land use." *Landscape Ecology* 26 (10):1463-1476. doi: 10.1007/s10980-011-9661-8.
- Rizzo, Davide, Fabio Casella, Mariassunta Galli, and Enrico Bonani. 2009. *La Gestione Delle Sistemazioni Idraulico-Agrarie Nel Monte Pisano: Schede Descrittive e Operative*.: Land Lab, Scuola Superiore di Sant'Anna Pisa, Comune di Calci.
- Rocheleau, Dianne. 1995. "Maps, numbers, text and context: mixing methods in feminist political ecology." *Professional Geographer* 47 (4):458-466.

- Star, Susan Leigh. 1999. "The Ethnography of Infrastructure." *American Behavioral Scientist* 43 (3):377-391.
- Stewart, Kathleen. 2017. "In the World that Affect Proposed." *Cultural Anthropology* 32, no. 2 (2017): 192–198. . " *Cultural Anthropology* 32 (2):192-198. doi: <https://doi.org/10.14506/ca32.2.03>.
- Swanson, Heather Ann. 2017. "Placing a Golden Spike at the Golden Spike: Railroads in the Making of the Anthropocene." " In *Placing the Golden Spike: Landscapes of the Anthropocene.*, edited by Dehlia Hannah, 102-111. Essay in edited volume tied to exhibit at INOVA: Institute of Visual Arts at the University of Wisconsin-Milwaukee.
- Swanson, Heather, Anna Tsing, and Nils Bubandt. 2015. "Less than One but More than Many: Anthropocene as Science Fiction and Scholarship-in-the-making." *Environment and Society: Advances in Research*. 6 (1):149–166.
- Tsing, Anna Lowenhaupt. 2015. *The Mushroom at the End of the World: On the Possibility of Life in Capitalist Ruins*: Princeton.

¹ Research for this paper was carried out during sixteen months of fieldwork during 2013-2014, and in the summers of 2015 and 2016. Earlier versions of this material were presented to the Center for Advanced Study on Arctic Domestication in the era of the Anthropocene at the Norwegian Academy of Sciences in 2014 and 2015. Marianne Lien and Niels Bubandt generously and carefully read earlier drafts. I have talked through many versions of these ideas with Anna Tsing.

² The term "Anthropocene" was coined by Paul Crutzen and Eugene Storer in 2000 (Crutzen 2002) and has given rise to a diverse set of responses from natural science, social sciences, and humanities. For a review of some recent approaches in the humanities and social sciences see (Swanson, Tsing, and Bubandt 2015).

³ The term "peasant" is deeply loaded. In what follows I use it to describe someone who might have identified themselves as a *contadino*. I use the term "farmer" for contemporary smallholders.

⁴ Debates about ontologies have created much controversy over the last few years (Bessire and Bond 2014; Blaser 2014). In this essay I concentrate on the ontologies that emerge through particular practices (Law and Lien 2012).

⁵ Ecological and climate modelers are very familiar with this kind of scale jumping, and seek to constrain it through practices of parametrization and tuning (Edwards 2010)

⁶ Infrastructure studies are a large and diverse literature (see Larkin 2013). An early canonical formulation was provided by feminist scholar Susan Leigh Star (Star 1999).

⁷ For a brilliant discussion of how we craft time machines by building relationships between particular non humans see Elaine Gan's work on rice time machines in South East Asia (Gan 2017 (In Press)).

⁸ In what follows I use the vernacular Italian term after its first introduction with a related English or Latin term.

⁹ I was inspired to plunge into drawing by a conversation with the biologist Peter Funk, from Aarhus University.

¹⁰ With affectionate acknowledgement of the drawings of Oliver Rackham (Grove and Rackham 2001)

¹¹ *Affrancato* literally means 'freed'. It is telling that foresters see high forest as a kind of enfranchisement from servitude to peasant *ceduo*.

¹² Numerous interviews in 2015 and 2016 were carried out in collaboration with anthropologist Fabio Malfatti.

¹³ For an account of water-powered industrialization in Southern Italy see Barca 2010, and of hydroelectricity across Italy see Armiero 2011.

¹⁴ Well-matured night soil, *bottino*, from the city of Lucca was used as fertilizer well into the 1950s.

¹⁵ Litter raking was formerly ubiquitous across central and southern Europe (Gimmi et al. 2013). In Italy this practice has passed almost unrecorded in forestry regulations, and was only picked up by ethnographic methods.

¹⁶ Although coming from a different tradition, these findings resonate with scholarship on affect, which highlights attunement to 'the forms and forces unfolding in scenes and encounters' (Stewart 2017).