

Correspondences for the Forest of Fiemme Multispecies Relations in the Aftermath of Vaia Disaster

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Abstract This paper explores the multispecies relations that characterise a specific temporal conjuncture of the Fiemme Valley: the aftermath of Vaia, a storm that crossed Italy in 2018 and whose repercussions continue to affect this Alpine territory. The Vaia disaster resulted from the cultural remodelling of two landscapes: the forest one, implemented on a local scale through silvicultural practices; the atmospheric one, implemented on a global scale with the emission of greenhouse gases. I aim to demonstrate that the emergence of a new landscape through encounters between multiple forms of life and agencies is irreducible to the anthropocentric perspective.

Keywords Vaia storm. Multispecies relation. Fiemme valley. Temporal conjuncture. Non-human correspondences.

Summary 1 Introduction. – 2 In the Forest of Relations. – 3 Conclusion.



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1 Introduction

Forests and mountain regions are irreplaceable laboratories for studying climate change (Baudo, Tartari, Vuillermoz 2007). They occupy a growing body of environmental research thanks to their critical role in the functioning of the geosphere: mountains are hot spots of biodiversity, supply 30-40 per cent of the Earth's freshwater and contain the primary terrestrial resources of carbon; furthermore, forests represent ecological buffers, capable of stabilising regional weather patterns (Moran, Ostrom 2005). Since the first conference on endangered atmosphere organised by Margaret Mead in 1975 (Mead, Kellog 1980), anthropologists have been increasingly involved in climate research.¹ They are

strategically well-placed to interpret, facilitate, translate, communicate, advocate, and act both in the field and at home in response to the cultural implications of unprecedented climate change. (Crate 2008, 571)

In this regard, ethnographic researches in mountain contexts are particularly significant. For example, starting from his fieldwork in Swiss mountain areas, Krauß pointed out the need to reconfigure our relations with the environment. He defines Alpine pastures “as an assemblage of people and things, of human and non-human actors” (Krauß 2018, 2).

This short essay explores the multispecies relations that characterise a specific *temporal conjuncture*² of the Fiemme Valley: the aftermath of Vaia, an extra-tropical cyclone that crossed Italy in 2018 and whose repercussions continue to affect the valley. First, I give a short presentation of the Vaia disaster, considering its deep entanglement with the history of the Fiemme valley. Then, I consider the different intentionality of three non-human actors: trees, mushrooms and insects. Each of these living beings is presented through the lens of a human interpretation of Vaia, which nevertheless cannot wholly overlap their species-specific subjectivity. Finally, I discuss the emergence of a new landscape through encounters between multiple life forms and agencies, which I call *correspondences*. According to Ingold, they describe the ways “along which lives, in their perpetual

¹ Crate, Nuttall 2009; Hastrup 2013; Barnes et al. 2013; Elixäuser, Böschen, Vogel 2018; O'Reilly et al. 2020.

² I preferred the term 'conjuncture' instead of 'frame' because of the particular *heterochronicity* underlying the Vaia disaster. Ssorin-Chaikov, referring to Foucault's work, defines heterochrony as “a crossing point of several temporal disjunctures that are constituted as a relation to temporalities that extend beyond the scope and the terms of this site” (Ssorin-Chaikov 2006, 356), and which, in my opinion, are not reducible to human agency alone.

unfolding or becoming, simultaneously join together and differentiate themselves, one from another” (Ingold 2021, 9). In this paper, I focus on the several unexpected (and unintentional) correspondences of the human and non-human agencies entangled in the Vaia disaster.

It is not a coincidence that Zanini and Viazzo observe the gradual establishment within the Alpine anthropology of line of studies dedicated to environmental issues in the last ten years (Zanini, Viazzo 2020, 23-5). The present research fits into this perspective, trying to merge the specific attention to the environment with a look towards multispecies ethnography. Almost three years after the start of the COVID-19 pandemic, it is now evident that men are inextricably linked to other non-human subjects and agencies, whether they want it or not (Keck 2020). The multispecies approach will likely become a fundamental tool to guide us in the tangle of these interrelations (Jensen, Morita 2013; Tsing 2015; Fabiano, Mangiameli 2019). The distinction between organism and environment, on which classical ecology was based, is now questioned by those scholars who point out the emergence of the Anthropocene as a distinct era marked by an unprecedented impact of human actions. Long-term repercussions of the actions of a *specific part* of humanity heavily affect the global climate. When faced with a heterogeneous and all-encompassing phenomenon such as climate change, anthropological knowledge can be crucial in mediating between times, scales and living beings. In other words, anthropology, and especially the multispecies perspective, can indicate new paths of coexistence within the Anthropocene. Nevertheless, Haraway teaches us (2016, 89-141) that coexistence goes beyond simple symbiosis: it determines a co-construction (or destruction) of the same environment, which she calls *sympoiesis*.³

Indeed, “can there be any better example of conviviality, of living and growing together, than the trees of a wood?”. This is what Ingold asks himself in his recent essay on correspondences (Ingold 2021, 19). My research also starts from the same premise: considering the forest as a privileged place to study multispecies relationships. My fieldwork focuses on the interventions of woodland restoration and reforestation in the Fiemme valley. Despite the dramatic situation and restrictions in Italy from early 2020 due to the COVID-19 pandemic, it was possible to carry out almost nine months of ethnographic research.⁴ The experiences and events I refer to in this essay occurred during the third and fourth field periods. In addition to numerous in-

³ Even Latour, overcoming certain philosophical ‘rigidities’ of his ANT (Actor-Network Theory), observes that “organisms make their own environment, they do not adapt to it” (Latour 2017, 103).

⁴ The research comprehends four main periods (February-March 2020; September-November 2020; April-May 2021; September-October 2021), with other minors (for a total of 5 weeks) and preliminary fieldwork during September 2019.

interviews with local stakeholders, I closely observed ordinary and extraordinary wood management practices. Furthermore, to consider the centuries-old history of the Fiemme community, I spent several weeks working in municipal archives and the historical archive of the Magnificent Community of Fiemme.⁵

Already during the second year of research, I focused on the impact and repercussions of the Vaia storm. The particular intensity of this extreme atmospheric event in Fiemme was not accidental but the result of an unexpected and uncontrollable synchronisation of temporality⁶ positioned at the intersection of different spatial scales and human/non-human agency (Martellozzo 2021). The Vaia event represented a disastrous intertwining of capitalist-driven practices, whose long-term repercussions have ‘resonated’ with each other: on the one hand, there are the forest management policies inherited from the eighteenth century, which shaped a large part of the Fiemme forests (Corona 2019); on the other hand, anthropogenic emissions of carbon dioxide, capable of altering global atmospheric landscapes (*airscape*). Vaia, which crossed northern Italy in October 2018, was the first atmospheric phenomenon of this kind to affect the Italian Alps. With more than 1 million and 400 thousand m³ of wood, the Fiemme Valley is the most damaged Forest District in the Autonomous Province of Trento and one of the most devastated in all northern Italy (APT 2020). The storm acted as a “revelatory crisis” (Solway 1994), showing the unsustainability of a certain historical way of inhabiting the valley. Despite the relevant changes in forestry management since the Eighties, the woodlands of Fiemme turned out to be very vulnerable.

To understand this fragility, we must necessarily take into account the complex interrelations of agencies. The Fiemme Valley is a territory inhabited by a series of non-human actors, which properly environmental anthropology – and not merely ecological (Crate 2011) – has to include. In this regard, the Vaia event has shown all the difficulties in answering the crucial question: who inhabits the mountain? That is a complex question, both for the local community and the ethnographer, called for a continuous decentralisation of his gaze and method.⁷ As summarised by Viazzo and Zanini, the Alps

⁵ This medieval institution, still existing, is undoubtedly the principal forest owner of Fiemme valley; it manages an environmental heritage of approximately 20,000 ha, which comprehends 60% of the Fiemme woodlands. This heritage can be classified as a commons due to its historical and management features (Ostrom 1990; Moran, Ostrom 2005). The Magnificent Community of Fiemme has literally shaped the landscape of this valley through nine centuries of forest management.

⁶ Anna Tsing gives an alternative definition, talking about “forms of temporal coordination” (Tsing 2015, 131).

⁷ This decentralisation is also epistemological, insofar as anthropologists must necessarily take into account other distinct knowledge and disciplines. I am aware I have no

have become a place of unprecedented negotiations, which reveal very different, if not irreconcilable, positions within the Alpine communities and, perhaps to an even greater extent, among those who live in the mountains and those who instead look or think of the mountains from afar. (Zanini, Viazzo 2020, 24; transl. by the Author)

2 In the Forest of Relations

Non-human agencies are irreducible to the anthropocentric perspective; there is always a residual dimension that overlaps human explanations, both scientific and 'popular': it comprises the species-specific rhythms of trees, mushrooms, and bark beetles. As such, the following cases are not a commentary on the cultural ways in which non-human beings 'mean something' from the human perspective. It does not mean that we will adopt the points of view of the tree, of the mushrooms, or of the beetle, resorting to a perspectivism *à la* Viveiros de Castro (2014) or considering autonomous *umwelten* (however intersected) such as von Uexküll (Ingold 2000, 176-8). In the first case, the ontological multiplication is based on a unique epistemology and on a perspective that is ultimately human (all too human). In the second, the *umwelten* are juxtaposed with each other, *interacting*, but the continuous process of mutual modelling is not considered. Instead, we agree with Emanuele Coccia (2016) when he states that every point of view (*point de vue*) is also a point of life (*point de vie*): countless ways of life branch out and correspond in the *same* world and in this regard to the passage of Vaia highlighted the centuries-old entanglement of people, trees, and other non-human beings. The crash sites in the Fiemme valley are more than 'wounds' in the forest: they represent glimmers through which to look at these correspondences in action.

Woodlands have an emotional significance for the human community, which cannot be ignored. During my conversations with the inhabitants, each interviewee remembered a meadow, a footpath, or a grove to which she/he was particularly attached. Vaia overwhelmed all these places. This represented the storm's significant impact on

specific expertise in either forestry or meteorology; nevertheless, it would not have been possible to understand the cultural dimension underlying the Vaia storm without resorting to interdisciplinary information, whose work of selection and *assembly* is to be considered an integral part of the research methodology. The confrontation with forestry experts and technicians proved to be fundamental: besides their theoretical preparation, they possess in-depth and specific knowledge of their territory. However, without the contribution of anthropology, it would not have been possible to achieve a framework for the storm's cultural life, necessarily connected to the debate on climate change.

the inhabitants due to their emotional involvement with the territory. Thus, the sense of estrangement caused by Vaia concerns two levels: on the one hand, the suffering for the loss of one's 'intimate' places; on the other, the sense of unease towards an almost unrecognisable landscape.

One of the more impressive testimonies I have collected is from Roberta Segata, a local artist from Cavalese. The changes in her relations with the forest are paradigmatic of the general estrangement suffered by many inhabitants. It could be seen as a loss of familiarity with the valley. Roberta told me about the wonder she felt on the morning of 30 October when the light entered her house from a new direction. Those trees that until then had shielded the house had now fallen to the ground. When Roberta reached the place of the crashes, she felt a sense of rejection, as if the forest was opposing her. The tangle of roots, flattened trees and branches stave off Roberta from entering 'her' woods: "it was as if the forest wanted to keep me away as if it didn't want me to get into its wounds"⁸ (Roberta Segata, unpubl. Interview, 15 September 2020). It is not just artists, lumberjacks or forest technicians who use phrases like these. Even "normal" inhabitants, people who frequent the woods little or not at all, mentioned a sense of estrangement that takes many forms, which I find particularly evident in Roberta's words. In her case, it derives from a daily relationship with the forests, towards which she recognises non-human intentionality, independent of her personal projections. Her descriptions remind me of a composition of the Italian poet Franco Fortini, *Gli alberi* (The Trees):

Gli alberi sembrano identici
che vedo dalla finestra.
Ma non è vero. Uno grandissimo
si spezzò e ora non ricordiamo
più che grande parete verde era.
[...]
Gli alberi sembrano identici,
la specie pare fedele.
E sono invece portati via
molto lontano. Nemmeno un grido,
nemmeno un sibilo ne arriva.
(Fortini 1973, 91)

The new landscape left the inhabitant of Fiemme without explanation and references. In some respects, this condition is paradigmatic of

⁸ Original text: "È stato come se la foresta mi volesse tenere distante, come se non volesse farmi entrare nelle sue ferite". All translations are by the Author.

the Anthropocene, as Latour (2017) recently affirmed; the multiple crises attributable to climate change – as in the case of Vaia – do not designate only the measurable alteration of a precarious (ecological, geophysical, or atmospheric) balance. Instead, they mark the limits of certain ways of conceiving the world and its relations: the ecological crisis is, therefore, and first of all, a crisis of meaning, and nevertheless, an environmental crisis. The sense of estrangement felt by the inhabitants of Fiemme could be seen as a specific ‘declination’ of this general loss of meaning; likewise, the Vaia disaster could be seen as a localised materialisation of climate change.

There is no doubt that Vaia became in recent years a central element in the social imaginary of the community, enriched by supernatural themes. The contained damage to the infrastructure and the absence of injured people or victims aroused wonder in the inhabitants; it was considered a sort of ‘miracle’. One year after Vaia, the mayors of the valley decided by mutual agreement to organise a ceremony in gratitude to Our Lady of Sorrow, to whom the community is particularly devoted. Thousands of inhabitants, from every municipality, took part in the pilgrimage to the Church of the Assumption in Cavalese, the oldest parish of the valley. Many believe St. Mary protected her devotees from the storm, thus explaining its apparently selective action, which damaged only trees. In his speech, the former Scario⁹ Giacomo Boninsegna said:

With this solemn Mass, Fiemme wanted to thank Our Lady of Sorrows for having saved the valley from human mourning during the Vaia Storm and to ask for new protection on the whole population, on our communities and our lumberjacks engaged in this enormous tree recovery operation and defence of the territory. The damage was massive. But, by Divine Grace, there was no victim.¹⁰ (Calamari 2019, 9-10)

It is important to note that the 2019 ceremony was a replica of another local ritual: the *Levada*, a procession instituted after World War II in gratitude to St. Mary for having protected the valley from bombing, that is, another possible disaster averted. In this perspective, regaining a sense of normalcy after a disaster means first making sense of the traumatic experience. From the extreme force of

9 The Scario is the representative and head of the Magnificent Community of Fiemme, elected by the Council of the *Regolani*.

10 Original version: “Con questa Messa solenne Fiemme ha voluto ringraziare la Madonna Addolorata per aver salvato da lutti umani la valle, durante la Tempesta Vaia, e per chiedere nuova protezione sulla popolazione tutta, sulle nostre comunità e sui nostri boscaioli impegnati in questa enorme operazione di recupero degli alberi e di difesa del territorio. I danni sono stati ingenti. Ma, per Grazia Divina, non c’è stata nessuna vittima”.

the wind to the width of the affected area, all these aspects heightened the representation of Vaia as an isolated and meaningless occurrence. Of course, this miraculous perspective does not seem to fit well with the general argumentation of this essay; nevertheless, it is still based on a distinct class of non-human actors, that of sacred figures such as St. Mary or other patron saints. Even if, unfortunately, there is not enough space to deepen this topic, it seemed appropriate to report it to show the heterogeneity of the attitudes of Fiemme's community. Another aspect that powerfully struck the community's imagination was the lack of animal carcasses among the crashes. This made the storm even more mysterious, as if the animals had been *purposely* spared.

Indeed hunters and forest rangers found some carcasses, but this fact has, in no way, affected the 'miraculous' representation of the storm. On the contrary, this prodigious connotation has made it possible to attribute to the atmospheric event a specific will¹¹ that transcends the physical laws; in this sense, the storm can be considered 'super-natural'. From another point of view, we can read this 'unnaturalness' of the storm (Ballard, McDonnel, Calandra 2020) as a counterpart of the scientific analysis that links Vaia to climate change. It does not mean that the miraculous perspective is a filtered and popular version of scientific publication: on the contrary, these interpretations have different origins and coexist in the same imaginary. As we have seen in the Scario discourse, the 'miraculous perspective' shines through public speeches and official ceremonies, expressing collective imaginary features in an institutional form.

The theme of the miracle came up also during interviews. Many people speak of the storm using turns of phrase to avoid the word 'miracle', but some are more explicit than others. Italo Giordani - the principal historian of Fiemme - lives in Panchià and remembers the night of Vaia very well. He highlights that several aspects of Vaia remain imponderable, although the origins of the weather phenomenon are now understood.

GIORDANI Well, let's say it's not politically correct today. But it is understandable: no one died! How can you not ask yourself the question, considering what happened? Because I mean, I was here, I felt it: it was a disaster. But nothing, no deaths. And I make a juxtaposition - that's why I say, be careful to use the term miracle - I don't understand why, the Soviet Union that collapses in 1989, without

11 Using an anthropological lexicon, we can translate this emic concept as 'agency'. Many inhabitants used the term 'will' (*volontà*) in conversations and interviews. It is not an arbitrarily choice: on the one hand, the term suggests a personification of the storm without affirming it directly; on the other, it recalls the supernatural will of Mary and the saints, tracing a symmetry between the intention to protect and to threaten.

anything happening, is something out of reality. It doesn't fit in history, it just doesn't fit in. But we cannot speak of a miracle [laughing]. [...] Or the fact that very few animals died, almost nothing. Even though they were literally under the trees as the wind blew them down.¹² (Italo Giordani, unpubl. interview, 19 October 2021)

According to Giordani, in 2018, there were some forerunners of the Vaia storm. Small meteorological events occurred between August and September, with rains and winds heavier than usual. Another phenomenon in the summer of 2018 was trees' massive production of seeds, especially firs and pines. The production of seeds in many plant species is not regular but depends on cycles of less or greater intensity. 2018 was a masting year in the Fiemme Valley, an event that did not go unnoticed by forest technicians. They work with scientific rigour, with figures and statistics, yet they murmur that this coincidence was strange: "it was as if the trees knew before...", but they cannot express themselves further. While arguing with Bruno Crosignani,¹³ I asked if there could be a hypothetical connection between the unusual mast seeding intensity and the passage of Vaia. He pointed out that what we humans interpret as a disaster actually represents a formidable opportunity for the expansion of the forest. The extreme winds tore down many trees, but they have also spread their seeds throughout the valley.

Another interesting phenomenon is the synchronisation of masting through the European forests, caused by a climatic teleconnection (Ascoli et al. 2017). With this term, Ascoli and colleagues refer to the capacity of certain climatic patterns to produce spatially correlated weather conditions, which influence trees' biological rhythms. In particular, the strict correlation of inter-continental masting is linked to the North Atlantic Oscillation (NAO) and its decennial trends. The NAO also plays an essential role in forming extra-tropical cyclones such as Gudrun, Vivian or Vaia, which raged through Europe over the last fifty years (Raible et al. 2020). Although a close correlation between Vaia formation and masting in Fiemme has not yet been demonstrated, this phenomenon concerns a specific relationship between

12 Original version: "Beh, diciamo che oggi non è politicamente corretto. Però è comprensibile: non è morto nessuno! Come fai a non farti la domanda, con quello che è successo? Perché io ero qui, io l'ho sentito, e voglio dire: è stato un disastro. Ma niente, nessun morto. E io faccio un accostamento - ecco perché dico, attenzione a usare il termine miracolo - non capisco perché, una Unione Sovietica che crolla nell'89, senza che succeda nulla, è una cosa fuori dalla realtà. Non ci sta nella Storia, non ci sta proprio. Però non si può parlare di miracolo [ride]. [...] Oppure il fatto che siano morti pochissimi animali, quasi niente. Nonostante fossero letteralmente sotto gli alberi mentre il vento li abbatteva".

13 Bruno Crosignani was the director of the Cavalese district forestry office until September 2021.

non-human agents in which humans have no role. In this regard, as suggested by Ingold (2021, 6), it demonstrates that other living creatures could also enrol other kinds into their own lifeways.

The synchronisation of masting represents a kind of scientific explanation that could probably satisfy the forest technician of Fiemme. Nevertheless, it is not a question of explaining 'how' Vaia happened, but 'why'. As in Evans Pritchard's famous example of the collapsing granary (1937), a factual explanation is insufficient to determine why a specific dramatic event has occurred. However, in the aftermath of Vaia, the community of Fiemme asked itself another crucial question: how to react effectively to the crisis of traditional forest management models (Gabrielli 2019)? Among the several proposals elaborated over the years, one, in particular, caught my attention: mycoforestry, that is, an innovative approach towards mushrooms for the territory.¹⁴ The creators of this ecological strategy are two members of the Magnificent Community of Fiemme: Ilario Cavada, a forestry technician of the MCF, and Andrea Daprà, mycologist and hiking guide. Their initiative consists of inoculations of different mushroom species to accelerate the decomposition process and mycorrhizal seedlings to regenerate the territory. Furthermore, the symbiotic association of roots and mycelium guarantees considerable resistance to the plant, accelerating its development and protecting it from parasites and harmful microorganisms.

In particular, mycoforestry seeks to optimise and extend the benefits of mycelial networks by strengthening new plants and enhancing the resistance (and resilience) of phytocenosis. That is why this proposal also seems particularly significant for its decentralisation of the usual ecological perspective between man and forest. Two fundamental factors are the matching of chosen mushrooms and the timing of their application. First, to intervene effectively, it is necessary to evaluate the best possible combination between trees and fungal species, preferring the local varieties. They have also been able to promote future relations with insects and birds, enforcing the entire trophic chain (Stamets 2005, 74).¹⁵ The sympoietic abilities of mushrooms allow them to reconfigure the habitability of the

14 Paul Stamets and Peter McCoy are the principal pioneers in this field. The techniques developed and applied by these two scientists include water filtering (mycofiltration), the elimination of toxic waste (mycoremediation), the cultivation of edible plants (mycogardening), the contrast to insects (mycopesticides), and support for reforestation (Stamets 2005, 69-79; McCoy 2016, 335-78).

15 There are very few mycoforestry experiments in the world today. Stamets conducted one of the first projects at Cortes Island (Canada), using mycorrhizal spruce seedlings for reforesting severely depleted areas (Stamets 2005, 78-9). More recently, the LIFE MycoRestore project has as its primary objective "the innovative use of mycological resources to improve the productivity and resilience of Mediterranean forests threatened by climate change" (<https://mycorestore.eu/it/life-mycorestore-2/>).

territory for or against other species. We find an example in Tsing's masterful work on traditional Satoyama landscapes in Japan: an unintentional and non-human design created these habitats, particularly favourable to the growth of matsutake mushrooms on which a thriving trade has been grafted (Tsing 2015, 152).

Studies conducted after the passage of cyclone Vivian (Wohlge-muth 2017) have shown the existence of a risky window period (protection gap) in which neither the fallen trees - now rotten - nor the new plants, still too young, can protect the damaged slopes. In this case, the inoculation of saprophytic fungi at the crash sites can accelerate the decomposition process of the wood on the ground, re-absorbing the biomass as humus (Stamets 2005, 73). Furthermore, through careful planning, these fungi can also inhibit the spread of certain fungal species in favour of others, thus preparing the reception of the new mycorrhizal plants. However, the definition of the experimental protocol required a lengthy preparation; the preliminary research phase, which is essential, includes a census of native fungal species to choose the most suitable mushrooms for inoculation.

Currently, possible candidates for experimentation are mushrooms of the genus *Trametes*, *Fomes* and *Armillaria*. *Trametes pini* (like *T. versicolor*) is a white caries fungus, one of the very few living beings capable of metabolising lignin. Andrea Daprà suggests pairing it with a brown caries fungus such as *Schizophyllum commune*, present in the valley and able to digest cellulose. The inoculation of both species would rapidly degrade the entire structure of the dead tree. There are also the species *Fomes fomentarius* and *Laricifomes officinalis*, also agents of wood decay: the second prefers conifers - larches in particular - and therefore would be appropriate for the composition of the Fiemme woods. Concerning the *Armillaria*, commonly known as *chiodino*, there are two species in the valley: *gallica* and *ostoyae*. The latter boasts an unsuspected record: it is the largest organism on the planet, whose mycelium occupies an area of hundreds of hectares in Oregon, connecting thousands of trees (Ferguson et al. 2003). The *Armillaria* is both parasitic and saprophytic, and due to its invasiveness, forest technicians regard with suspicion this mushroom; indeed, this reputation could hinder its use in test areas. Part of this negative consideration derives from the general perception of fungi in the Italian forestry world, a field that is significantly the responsibility of forest pathologists. The idea of mushrooms as harmful entities has a long history. We find an example in this unedited epistolary document,¹⁶ written by the forest maniple Guido Koch in 1931. From the one side, this document shows how much the nega-

¹⁶ The document is conserved in the historical archive of the Magnificent Community of Fiemme, box 452, dossier 20, doc. 20-21.

tive perception of mushrooms is rooted in the Italian scientific field; from the other side, it witnesses the century-old history of encounters between nursery workers and forest technicians of the Magnificent Community of Fiemme and fungal species:

As soon as the snow melted, in two forest nurseries of this Magnificent General Community of Fiemme - located at an altitude of 1500 m.s.l. - the very high mortality in spruce seedlings of one or more years was repeated. [...] I allow myself to send you some specimens with deep prayers of kindly wanting to classify the parasitic fungus and, if possible, suggest the relative means of struggle.¹⁷

The letter is addressed to professor Peyronel, director of the Royal Laboratory of vegetal biology of Florence. He deflates Koch's alarms, identifying the endemic mushroom species which affected the seedlings:

The spruce seedlings you sent me are infested with *Cladosporium herbarum* in the aerial part, especially in the leaves, and by a *Fusarium* in the roots. Some are also affected by *Botrytis cinerea*. It is rather difficult to say which of these fungi is guilty of the death of the seedlings [...] it is probable, however, that the primary cause of the deterioration was the too-long stay under the snow.¹⁸

Nowadays, Ilario and Andrea are trying to establish a new alliance with mushrooms, co-opting their sympoietic ability; in this sense, there is a drastic discontinuity with the vision expressed by Koch, passing from opposition to collaboration with fungal species in nurseries. As well as the other species suitable for inoculation, the *Armillaria ostoyae* is endemic in the valley and is already running in the sites crashed by Vaia. However, several members of the forestry technical office expressed concerns about this project. According to them, there is a real risk of losing control of the spread of the inoculated fungal species, but as Ilario brilliantly replied, "when did we ever have control over it?"

If anything, other creatures proliferate 'excessively' in the aftermath of Vaia. Several times, while I was accompanying Andrea and

17 Original version: "In due vivai forestali di questa Magnifica Comunità Generale di Fiemme, posti ad un'altitudine di 1500 m.s.m. si è ripetuta, appena sciolta la neve, la fortissima mortalità nei semenzali di abete rosso di uno e più anni. [...] mi permetto inviarle alcuni esemplari con viva preghiera di voler gentilmente classificare il fungo parassita e, se possibile, suggerire i relativi mezzi di lotta".

18 Original version: "Le piantine di abete rosso da lei inviatemi sono infestate dal *Cladosporium herbarum* nella parte aerea, e specialmente nelle foglie, e da un *Fusarium* nelle radici. Qualcuna è colpita anche da *Botrytis cinerea*. Dire quale di questi funghi sia colpevole della moria delle piantine è piuttosto difficile [...] è probabile, però, che la causa prima del deperimento sia stata la troppo lunga permanenza sotto la neve".

Ilario in their periodical surveys, we commented on the red ‘flames’ that colour large areas of the slopes. In the last two years, the forests of Fiemme have been affected by the massive spread of the spruce bark beetle (*Ips typographus*), an endemic insect and parasite of the Norway spruce. The attacked plants are concentrated in the woods of the Lagorai mountain range, but it is difficult to explain their distribution. In addition to the larger areas, smaller groups (even one or two isolated trees) are visible very distant from the Vaia crashes. So why did the bark beetle hit those specific trees? Andrea thinks that the mycorrhizal network that connects plants and mushrooms can provide helpful information on the ‘logic’ of the areas affected by the bark beetle. Instead, for Ilario, the reason lies in the Norway spruce’s excess, so the insects do not act according to their standard behaviour patterns. Both, in their reasoning, tried to match their rational knowledge and personal experience of the forest with this new ‘strange’ habit of this pest.

The presence of the spruce bark beetle in this valley has a long history. In some respects, Fiemme is a privileged site for scientific research on this insect, thanks to the abundance of Norway spruce and the homogeneity of the forests (Ambrosi, Angheben 1986). The recent epidemic concerns all the areas damaged by Vaia and is, in fact, a direct consequence of that storm. Commonly the spruce bark beetle attacks only old or debilitated trees, but after the passage of Vaia, it also started to attack healthy and very young spruces. The bark beetle outbreaks add a further element to the temporal conjuncture of Vaia, representing a kind of long wave of the disaster. According to Andrea Bertagnolli, head of the forestry office of the Magnificent Community, the damage of this epidemic will most likely equal that of the storm.

For many inhabitants of Fiemme, it was spontaneous to compare the bark beetle emergency to that of COVID-19. Both cases were perceived as an attack by an invisible agent, with severe effects on the valley’s economy. However, for both the spruce bark beetle and the virus, we must remember the conclusions of Frédéric Keck:

viruses are not intentional entities aiming at killing humans, but signs that the equilibrium between species in an ecosystem has been disrupted. (2020, 178)

In our case, the massive spread of spruce bark beetle is an amplification of the normal ecological relations between tree and insect induced by Vaia. However, even in this case, the epidemic is not a purely natural event: without the massive presence of Norway spruce, there would not have been so many outbreaks.

INTERVIEWED Even here in Moena the bark beetle is doing damage. Even here, in my opinion, the problem was underestimated and

they tried to control it with natural traps, but it is too little compared to the disaster. Then, most people are not aware of the bark beetle, perhaps only because of the “flames” that are seen in the forests. Many do not even know what it is, but who knows, who goes to the woods, understands. My husband, for example, after Vaia had said: “You will see that the *becherlo* arrives, and what damage it will do!”. And indeed this is worrying, also because it attacks healthy plants, not already sick ones. Then my husband was convinced that it didn’t attack the larch trees – it was a bit everyone’s idea – and, instead, he found a plant that according to him was attacked by the bark beetle. Despite being a larch. He was really amazed. The local forester had assigned him this dry larch to cut, quite normal: it happens that the larches dry out because they are slower to grow than the fir trees and, in this way, they are overwhelmed. Convinced it was shrivelled for this reason, instead, it was attacked by the bark beetle. He told me “for all my life I thought that the larches were not attacked, but now they are”.¹⁹ (M.P., unpubl. interview, 19 October 2021)

The explanation of the lumberjack for this absolutely unusual phenomenon lies in the concentration of the bark beetle: the impressive number forced the insects to eat even larches to feed themselves. Andrea Bertagnolli argues that these attacks are caused by a different bark beetle species, endemic but much rarer. Indeed, the presence of this larch bark beetle (*Ips cembrae*) was also confirmed to me by a timber trader, Adriano Giacomuzzi. In his decades of experience, he has repeatedly found larch trunks with signs of barking. Another riveting testimony comes from the forest custodian of Ville di Fiemme, Christian Guadagnin. The forests of Varena, the higher municipality in the valley, are within his competence. The slopes over Ville di Fiemme were rarely affected by bark beetle attacks. There was only one memorable case in 26 years, but the situation changed in 2020, with the diffusion of some outbreaks in marginal areas near

19 Original version: “Anche qui a Moena il bostrico sta facendo danni. Anche lì, secondo me il problema è stato sottovalutato e hanno provato a controllarlo con le trappole naturali, però è troppo poco rispetto al disastro. Poi, la maggior parte della gente non si rende conto del bostrico, forse solo per via delle “fiammate” che si vedono sulle foreste. Tanti non sanno nemmeno cos’è, ma chi lo sa, chi frequenta il bosco, capisce. Mio marito per esempio, dopo Vaia aveva detto: “Vedrai che arriva il *becherlo*, e che danni che farà!”. E in effetti preoccupa, anche perché attacca le piante sane, non quelle già malate. Poi mio marito era convinto che non attaccasse i larici, ed era un po’ l’idea di tutti, invece ha trovato una pianta che secondo lui era attaccata dal bostrico. Nonostante fosse un larice. È rimasto proprio stupefatto. Il guardiaboschi gli aveva assegnato questo larice secco da tagliare, abbastanza normale: succede che i larici si seccano perché più lenti a crescere degli abeti e in questo modo vengono sopraffatti. Convinto si fosse seccato per questo motivo, invece era attaccato dal bostrico. Mi ha detto “tutta la vita ho pensato che i larici non venivano attaccati, e invece ora sì”.

the crashes. Christian immediately noticed the presence of this minority species:

There is a larch-specific bark beetle. It is not as ‘bad’ or numerous as that of the spruce, but it is still present in the woods, albeit sporadically. Here we have also some Stone pine that has been affected, by another species. Fortunately, there are no extensive attacks as happens in the fir, perhaps because the Stone pine is quite high and the temperature changes are frequent therefore the period in which the bark beetle can act is shorter. You can see small groups, of three or four plants here and there, a bit patchy.²⁰ (Christian Guadagnin, unpubl. interview, 28 October 2021)

According to entomology, the same bark beetle species affect Stone pine (*Pinus cembra*) and larches. However, beyond the taxonomic distinctions, the unprecedented attention of the inhabitants towards these insects is interesting. Not just forest custodians and timber traders, who know the bark beetle for strictly professional reasons. Even residents who frequent the woods sporadically now pay attention to a creature they would not normally even notice. The action of the bark beetle is visible to all the inhabitants of the valley thanks to the ‘flames’ that redden spruce forests. However, the human perception of the epidemic is fallacious insofar as it does not contemplate the insect’s vital rhythms; the reddened trees have already been abandoned by the spruce bark beetle, which has moved to those immediately adjacent without giving any visible sign. This condition makes it extremely difficult both to make a precise estimate of the spread of these insects and to undertake contrasting actions.

3 Conclusion

We can consider the Fiemme Valley as a complex scenario in which human and non-human actors seek to negotiate new forms of coexistence. For example, mycoforestry aims to regenerate the territory by accurately manipulating *correspondences* – or in Haraway terms, “establishing relationships” – between plant species and microorganisms. These encounters can also be problematic, as the recent bark

²⁰ Original version: “C’è un bostrico specifico del larice. Non è così ‘cattivo’ o numeroso come quello dell’abete rosso, ma è comunque presente nei boschi, anche se in modo sporadico. Qui da noi sono stati colpiti anche dei cirmoli, da un’altra specie ancora. Per fortuna, forse perché il cirmolo è abbastanza in quota e gli sbalzi di temperatura sono frequenti e quindi il periodo in cui il bostrico può agire è più breve, non ci sono attacchi estesi come succede nell’abete. Si vedono dei piccoli nuclei, di tre-quattro piante qui e lì, un po’ a macchia di leopardo”.

beetle epidemic shows us. The unprecedented attention of the inhabitants towards these insects expresses the need to make sense of the post-Vaia events. However, these attempts are constantly frustrated by the impossibility of bringing actions and phenomena back to a purely human perspective. In all the cases I have presented and discussed, the human capacity to understand and influence (i.e. control) relationships with non-humans are severely limited.

The most interesting thing, in my opinion, is that this loss of control does not only concern non-human agencies but also human ones. As mentioned in the introduction, the Vaia disaster resulted from the cultural remodelling of two landscapes: the forest one, implemented on a local scale through silvicultural practices oriented by the wood market; the atmospheric one, implemented on a global scale with the emission of greenhouse gases. In both cases, human agency has intertwined with the temporal rhythms of other actors, inadvertently influencing atmospheric or biological processes. These correspondences did not cease with the passage of Vaia nor with the current bark beetle epidemic. The extent of this temporal conjuncture is “patchy”, using a term dear to Ingold (2021). It describes “a mosaic of temporal rhythms and spatial arcs” (Tsing 2015, 4), which is not reducible to a single event or a single agency. The plants cut down in 2018 had been planted two centuries earlier. They have had parasitic or symbiotic relationships with thousands of fungal species throughout their life. For decades they have been storing the carbon dioxide emitted by human activity. An inter-continental climatic teleconnection has favoured the massive production of seeds. A storm, boosted by centuries of anthropogenic emissions, felled these trees one October night. Three years later, the first outbreaks of bark beetle have begun in their ruined trunks. New mushrooms are turning woody matter into humus. New plants spring up in that humus from seeds dispersed during the storm. Where does this story really begin? Which moment is more important than the others? I agree with Mathews when he affirms that:

These landscapes are simultaneously [...] linked to multiple histories and rhythms that can help us escape from thinking of nature or history as singular. Multiplying our understandings of possible pasts and futures, and of who might be helped or hurt by these futures, makes the Anthropocene political. (Mathews 2018, 387)

His observations remain valid in our case also, although he refers to the pine and chestnut forests of the Monti Pisani. In this contribution, I have tried to emphasise non-human participation in these anthropogenic forest histories, focusing on the temporal conjuncture of the Vaia disaster. Trees, mushrooms, insects, and atmospheric patterns knot together their temporal rhythms to reconfigure the chang-

ing landscape of Fiemme. Faced with this transformation, the challenge for the human community is understanding how to take part in it, renouncing the illusion of control derived from the anthropocentric perspective.

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