

Chapter Eight

Conclusions



Fig. 8.1 Prosecco grapes ready for musting at Perlage.

8.1 Introduction

In this thesis, I applied and extended the insights of post-humanist and Science and Technology Studies (STS) theorists to make sense of the mundane, every-day character of dealing with non-human Others in goal-oriented and ethically informed encounters of making organic wine. I argued that two dominant modes of ordering practices and discourses of organic winemaking can be identified: pacification, and making spaces for nature. I argued that both those modes of ordering (re)create markets and ethics of organic wine production. At the same time, I argued that they perform radically different (re)creations, and different ontological politics, with pacification working towards stabilisation and standardisation, and making spaces for nature working towards unpredictability and diversification.

By embracing indeterminacy as an inherent element of agri-food practice, my analysis pushed the understanding of the day-to-day practices of working with vital materialities beyond the limiting vocabulary of aberrance and obstacle, and uncovered the deep inter-dependence of human and nonhuman action. Throughout the thesis, I argued that at all stages of production, the human workers and the non-humans they work with are entangled in ways which challenge the dominant understanding of production in agri-food literature as an exercise of human intentionality on passive and mute 'nature'. Applying the methodological and analytical tools of posthumanist and STS theories to the field of agri-food, I showed, allows us to take the understanding of making and marketising of agri-food products in exciting new directions.

In this thesis, I focused on three areas of organic wine-making practice where a posthumanist analysis can take forward our existing understandings. Firstly, in Chapter Four, I argued that the embodied skills of vine work can only be learnt through sensitive engagements with the material world of practice. Secondly, in Chapters Five and Six, I suggested that we need to move beyond examinations of codified ethics in agri-food production, and examine the relational dimension of ethics of production. Thirdly, in Chapters Six and Seven, I showed that markets for agri-food products should be seen as performative and material, and profoundly influenced by the very goods that travel through them.

In this concluding chapter I reiterate and critically assess the contribution of this thesis to the current approaches to studying and understanding agri-food production, and suggest how engagement with materiality in agri-food studies could be productively taken forward.

8.2 Overview of arguments

In this thesis I demonstrated what a focus on materials and practices can do to our existing understanding of organic wine production, and of agri-food production in general. In Chapter Two, I situated my inquiry in the context of agri-food studies, and of post-humanist literature. I argued that in social science studies of wine production and consumption, the co-existing and co-constituting spheres of 'nature' and 'society' were being consistently held apart, in spite of the acknowledged centrality of natural processes to the economic, social, and cultural significance of wine. I also argued that in spite of calls for recognition of the significance of nature as more than a resource for and/or obstacle to processes of capital accumulation in agri-food studies, there is still a need for serious empirical investigations of nature as

meaningful in this context. I suggested that engaging with agricultural nature through a focus on materiality is a promising avenue of investigation, and one which is still under-developed. In Chapter Two, I also acknowledged this thesis' intellectual roots in the actor-network theory and post-humanist studies canon. I suggested that post-humanist field of inquiry would now benefit from an engagement with more risky and dangerous spaces and practices, such as those of agri-food production. I also argued that post-humanist scholarship needs to widen its focus from 'big like us' and 'animal like us' non-humans, and I noted the contribution of this thesis to the understandings of human-plant (Chapter Four) and human-microbe (Chapter Five) relations. I argued that the context of food production is immensely relevant to post-humanist approaches, and an inquiry into its spaces and practices as both expressive and constructive of ethical debates has radical potential.

In Chapter Three I showed how this thesis contributes to the existing methodologies for following practices and non-human actors. While in this thesis I employed ANT as a basic sensibility to the heterogeneity of the world (Law 2009), I also extend the ANT methodology in important ways. I particularly drew attention to the potential of participant observation and auto-ethnography in uncovering the embodied and affective dimension of heterogeneous assemblies. I also demonstrated the importance of the physical characteristics of the non-humans being 'followed' to the choice of methodologies. I argued that to engage meaningfully with the temporarily emergent materialities of living non-humans such as plants (or indeed microbes), long periods of ethnographic fieldwork are needed. Additionally, I considered the potential of language learning as a research tool, and showed how gaps in linguistic knowledge can serve to open up black boxes of taken-for-granted practice. I further considered the importance of translation as a co-construction of meaning between researchers and participants.

Having discussed how the methodology of following the actors resulted in a focus on vines, yeasts and sulphur dioxide as key non-humans in organic winemaking, in the following chapters I addressed particular effects of each of these nonhumans in turn.

In Chapter Four, I challenged the understanding of skilled agricultural work as an exercise of human intentionality on mute and passive nature through an exploration of grape-growing skills. In this chapter, I applied Ingold's concept of taskscapes (2000) and Pickering's concept of temporal emergence of socio-technical phenomena (1995, 2005) to the field of agri-food, and I argued that we need to appreciate the deep co-dependence of agricultural materialities and agricultural workers. I argued that agricultural work needs to be seen as skilled, and that this skill can only be acquired through sensitive, imaginative, and responsive interactions with the material characteristics of the field of practice. In the context of agri-food, I suggested, we need to recognise the importance of the 'apprenticeship model' of knowledge acquisition, and to further explore what kind of knowing these embodied and localised understandings lead to. In the case of grape-growing, I argued that this sensitive, embodied, and temporal knowledge of vines and vineyards impacted on the way workers dealt with the uncertainty of grape harvests. I argued that uncertainty was recognised by these workers as an inherent component of working with vines. Thus this chapter pointed to the importance of the practical knowing of indeterminacy (Hinchliffe 2001) in skilled agri-food work, and suggested a key area for further investigation in agri-food studies.

Indeterminacy as an inherent element of working with lively (and living) materialities was further examined in Chapter Five, where I explored the connection between indeterminacy, naturalness, and ethics of production. In this chapter, I contributed to the debate about the ethics of living in a world which is more-than-human (Whatmore 2006) by investigating what kinds of practices make it possible for 'the ethical' to emerge in relations between human winemakers and brewer's yeast. I challenged the dominance of 'codified ethics' in understanding the ethical dimension of food production, and suggested an inflection of the agri-food ethics study agenda towards relational ethics (Whatmore 1997). In the chapter, I discussed winemaking practices strongly influenced by the principles of oenology, and artisan practices, which made use of oenological knowledge more sparingly, and which often created situations of indeterminacy. I argued that brewer's yeast could be seen to exist as a matter of ethical concern in situations where its *telos*, that is its nature as independent of human intentionality, was practically recognised, and that this situation was more prevalent in artisan production. I thus showed that the making spaces for nature mode of ordering resulted in the creation of indeterminacy. At the same time, I demonstrated that these practical ethics of working with yeast were not motivated by an abstract recognition of yeast as ethical, and thus by codified ethical approaches. Instead, I argued that the 'ethical status' of yeast formed a part of a relational ethics of wine producers, in which their relationship with Nature, and their personal ethical identities played a more central part than codified ethics of organic production.

The practical and ethical connection between indeterminacy and naturalness was further developed in Chapter Six, where I explored the practices of using the wine preservative sulphur dioxide (SO₂), a key tool for the limiting of indeterminacy in winemaking. In this chapter, the tension between the making spaces for nature mode of ordering, and the pacification mode of ordering was examined in more detail. I argued that SO₂ participated in both modes of ordering, and demonstrated how the stability of organic wine markets depended on keeping these two performances apart. I showed that SO₂ was a central element of organic wine markets, as its bio-chemical effects on wine enabled the participation of organic (and indeed conventional) wines in markets which were distant in space, and in which face-to-face communication between consumers and producers was not possible. At the same time, I argued that due to the perception (by winemakers and consumers alike) of SO₂ as an 'unnatural' presence in 'natural' wines, and due to its potentially allergenic effects, SO₂ was ethically uncomfortable for organic wine producers. I argued that while the two performances of SO₂, as central to the marketisation of organic wines, and as ethically uncomfortable, interfered with one another, they were both necessary if the organic wine markets were to be both perceived (by consumers and producers alike) as ethical, and to be successfully marketised in the context of dominant wine markets. Thus, I argued, the marketisation of organic wines depended on SO₂ being black-boxed; present, but not discussed.

In Chapter Seven, I probed this theme further, and applied the performativity of markets theory (Callon et al. 1998) to the study of processes of marketisation of organic wine. I contributed to the work on performative markets by arguing, with Gregson et al. (2012), and contra Çalişkan and Callon (2010, 2011), that not all goods need to have their qualities materially and discursively pacified in order to enter into markets. Indeterminacy, I showed,

can be an element of markets for certain organic wines. I demonstrated how 'lively' wines, that is those wines the characteristics of which cannot be easily determined and fixed, challenge the qualification trials of dominant wine markets. The marketisation of such 'lively' wines, I showed, requires the construction of 'alternative' marketisation channels. These channels are less dependent on the dominant markets' qualification trials, and instead centre on consumers' embodied knowledge of wines' characteristics. I argued such alternative markets are based on a radically different performance of taste than those of the dominant wine markets, with taste understood not as an inherent property, but an evolving relationship (Teil and Hennion 2002). An analysis of such alternative markets, I argued, can extend our understanding of the relationship between uncertainty and taste, and suggest new fruitful directions for cultivating palates better attuned to indeterminacy of taste which is inadvertently produced in the making of 'natural' agri-foods.

Overall, in the ethnographic chapters I argued that the practices of making organic wine can be usefully understood as a series of practices aimed at a goal-oriented and ethically informed 'dealing with' the vital capacities of non-human entities such as vines, yeasts and sulphur dioxide. While the long term goal-orientation of these practices originates in the human intention, and is expressed in modes of ordering as 'ordering attempts', their day-to-day performance is characterised by a sense of emergence, and as a result by uncertainty. Uncertainty emerged as an inescapable element of production, as the exact characteristics of vines, harvests and wines could be fully anticipated in advance. How much the uncertainty becomes a hindrance, I have argued, depends very strongly on the marketisation channels and methods a winery is involved in. Working towards greater calculability (Callon and Law 2005), and thus greater certainty, is possible, but carries ethical repercussions as a recognised act of ontological politics (of choosing a particular future) which may be in conflict with the ethical principle of making spaces for nature in organic wine production. Working in situations of uncertainty is possible, but hinders participation in calculation-oriented markets. However a joint labour of producers and consumers may result in alternative markets in which uncertainty is an accepted (possibly even coveted) element of consumption.

8.3 Contributions

By applying and extending post-humanist insights about materiality and performativity to the field of organic wine production, this thesis offers a new approach to the field of social studies of wine, and of agri-food production more generally. It proposes a move beyond conceptualising agri-food 'natures' as economically or ethically passive, and towards relational understandings of both markets and ethics of agri-foods. This relational perspective offers new entry points for critiques of the current agri-food system.

In this thesis, I proposed that in order to understand the production, marketisation, and ethics of making organic wines, and agri-food products more widely, we need to turn our attention to the *stuff* of food-stuffs, to the materials and processes that are laboriously stabilised, for a time, in the deceptively fixed form of goods. Organic wine production, I showed, is a process of material transformation. In a rather different context (of car manufacturing and industrial steel production), Hudson recently commented that social scientists studying production and markets need to 'engage more closely with "the stuff that things are made of", the properties of the materials, their microstructures and their transformations" (2011: 2) to better

understand the dynamics of value and exchange. Similarly, and closer to home, in his historical study of milk and wine production, Atkins (2011) called for more attention to the ‘stuff of foodstuffs’ as temporarily emergent, and as inherently uncertain, as well as to the effects the material characteristics of foods have on food chains, and on notions of food quality.

Following these calls, in this chapter I argue that the field of agri-food can both benefit from and significantly contribute to the current (re)turn to an interest in materiality not as ‘indifferent stuff of the world “out there”’, but as ‘the intimate fabric of corporeality’ (Whatmore 2006: 602). For post-humanist studies, agri-food production provides an important context for less enchanted (as per Bennett 2001), and more gritty and high-risks engagements with materiality. Making things for sale, and so engaging with the material world in a goal-oriented, but not ethically indifferent manner, is a quite different context to low-risk and domesticated settings of home and leisure spaces which have dominated much post-humanist inquiry to date. When economic survival is at stake, the tension between human intentionality and the power of materials can be seen to emerge more forcefully.

My concern in this thesis with materials as active, transformative, and relational, but also as risky, surprising, and potentially dangerous, is shared with other inquires within the Waste of the World project, of which this PhD thesis is part. Materials, as Gregson and Crang (2010), and Gregson et al. (2010, 2012) have shown, are powerful both as the lively stuff of the world, and through the ontological politics in which they participate. In agreement with these authors, in this thesis I have demonstrated that materials of agri-food production are not stable and fixed essences, but things-in-processes.

This processual and relational understanding of materialities invites a more serious engagement with the temporality of materials, and the indeterminacy this temporality necessarily produces, an engagement which has been limited in the field of agri-food studies to date. In next two sections, I consider how agri-food literature could engage more explicitly with the temporal dimension of agri-food materialities, and with indeterminacy as an inherent element of agri-food production practice. I further suggest that a key point of entry for these engagements could be via inquiries into practices of agricultural work. Agricultural work, I argue, is a skilled activity. In agricultural work, the materiality of the world is interacted with in a goal-oriented manner, and the indeterminacy inherent in the world of materials is worked with. I thus call for the recognition of agri-food work as skilled work, and so for the exploration and valorisation of the embodied practices which enable the skills necessary for the production of agri-foods to survive, and to be learnt.

8.3.1 Agri-food materialities and time

This thesis followed the yearly cycles of working with vines, yeasts and sulphur dioxide. In this exploration, I constantly highlighted the temporal dimension of materials, and I drew attention to the need to see materials as relational processes rather than fixed essences. The powers of materials, living and nonliving, I argued, reside as much in their inherent characteristics, as in the networks which allow for an expression of these characteristics. The approach to materiality I developed in this thesis is thus similar to the process-oriented understanding advocated by Whatmore (2006), and Ingold (2011), who argues that ‘[f]ar from being the

inanimate stuff typically envisioned by modern thought, materials (...) are the active constituents of a world-in-formation' (p. 28; see also Gregson et al. 2010).

This temporal and relational understanding of materiality, while already on the agenda of post-humanist studies (see especially Gregson et al. 2010), would benefit from further investigation, both empirical and theoretical. In order to think productively about the material world we live in, I argue, we need to work to re-incorporate temporality as an inherent element of materiality. Further engagement with the spaces of agri-food, and their microbial, plant, and animal materialities, could open up a fertile empirical ground for an exploration of the impact of things-as-processes.

What this thesis proposed is an understanding of materiality as both accessible to the senses, and as always remote and indeterminate due to the complexity of the temporal changes it constantly undergoes. I have found Adam's (1998) 'double understanding' of (natural) material processes particularly useful in this regard, and I believe it could provide a powerful tool for further work in agri-food and beyond. Adam proposed a distinction between *natura naturata*, the visible 'face' of material nature, and *natura naturans*, the invisible drivers of this nature, which are the unfolding of the *telos* of its different and constantly interacting components. Our understanding of action in the material world of 'nature', she argued, is skewed by a fixation on the visible materiality of things, to the detriment of the invisible temporal emergence of things-as-processes, always situated in particular relational contexts. Importantly, thinking about temporal materiality of the material world as 'nature' need not let the dualisms of nature/culture in through the back door. By putting the human as a relational being firmly back into nature understood as the complexity of the (socio)material environment, and by recognising humans' inherent corporeal dependencies and influences, scholars in agri-food could extend their focus from temporarily fixed forms, and (re)turn to a knowing of life as process. My exploration of the lively, contextually-known, and carefully tinkered with materiality of nonhumans in organic winemaking contributes to this, increasingly urgent, debate.

8.3.2 Agri-food materialities and indeterminacy

The temporality of materials necessarily opens up the issue of indeterminacy. As Adam (1998) convincingly argues, interacting with the materials of the natural world is always characterised by indeterminacy, as the time lags between action and symptom easily overwhelm human time scales, and the establishing of cause-effect relationships quickly becomes impossible. Adam's (1998) critique of the persistence of positivist approaches in acting on negative environmental change resounds with general concerns about the impact of the positivist dogma in social sciences today. Concerns about the negative environmental and societal effects of the positivist approach have fuelled the current debate surrounding the 'rematerialisation' of social science inquiry, which aims to challenge approaches which uphold that 'the stuff of the world is so much putty in our hands' (Whatmore 2006: 603). Practice- and materials- centred inquiries, such as the research presented in this thesis, question the assumed knowability and controllability of the non-human realm by highlighting indeterminacy as an inescapable element of acting in a heterogeneous world. A serious engagement with the creative and disruptive liveliness of 'things', however, continues to be largely absent from agri-food literature.

A different, more traditional conceptualisation of materiality prevails in agri-food literature, and is expressed in an increasing need for calculability, and an ongoing 'outflanking' of nature (Murdoch and Miele 1999) in agri-food production. The tension between naturalness/indeterminacy and calculability (and so the tension between the modes of ordering of making spaces for nature and of pacification), described in this thesis, can be seen to play out in all sectors of agri-food. Predominantly, this tension continues to be thought of in terms of the limits nature poses to the expansion of capital, and the methods capital develops to overcome these limits (see e.g. Goodman and Redclift 1991, Murdoch et al. 2000). As a result, the lively materiality of the world continues to be thought of in terms of aberrance and obstacle in most agri-food literature.

In this thesis, I have proposed a different understanding of indeterminacy in the world of agri-food, as not aberrance, but an inherent element of practice. Thus a key contribution of this thesis lies in the exploration of practical ways of knowing and working with indeterminacy in the processes of organic wine production. Organic winemakers' practices discussed in this thesis demonstrated a practical knowing of the limits to both knowledge of and intervention into the temporarily changing materialities of wine products (and their constituent materialities).

I believe a theoretical and practical acknowledgement of indeterminacy as a constant element of agri-food production is both necessary, and would have profound consequences for the field of agri-food studies, and indeed agri-food policy. Indeterminacy is currently silenced in dominant discourses of agri-food production and sales, in which the materialities of crops and commodities alike are portrayed as passive and controllable. This impression of control, however, and the resulting apparent stability of agri-food networks, is not only temporary, but also maintained through similarly silenced processes of tinkering, tuning, and adjustment. My exploration of these practices in this thesis contributes to both description and valorisation of the ongoing labour of heterogeneous agents in stabilising agri-food networks. It also shows the dependence of these networks on stabilising materialities, such as those of sulphur dioxide. The lesson of the material rootedness of even the most complex agri-food networks is worth examining in much more detail, and poses challenges to the current normative ethics of food production, as I discuss further below. An examination of these dependencies in other areas of agri-food production can provide spaces for further legislative, ethical, and environmental interventions. Ongoing explorations of indeterminacy as a constant element of agri-food work should result in a foregrounding of the precautionary principle in environmental interventions (Adam 1998). It could also facilitate the construction of agri-food networks which are less rigid, and better adapted to dealing with uncertainty as not simply an obstacle, but as an inherent element of agri-food systems (Hinchliffe 2001).

8.3.3 Temporality, indeterminacy, and skill

The connection between the temporality and indeterminacy of lively materialities, discussed in this thesis, foregrounds the issue of risk, and of economic survival. Agri-food production, such as organic winemaking, is a goal-oriented endeavour: all interactions with the material world are geared towards generating products for sale. As a result, the indeterminacy of the material world has to be practically dealt with. This 'dealing with' is achieved through the practices of work which are sensitive to the temporal dimension of the world of agri-food practice.

In this thesis, I have shown the importance of broad and hands-on knowledge of the local conditions of production, the temporal evolutions of their materialities, and the situations of indeterminacy these evolutions produce, for working with the materials of organic winegrowing. My exploration of the practical ways that organic winemakers deal with the unpredictable nature of living materialities of vines, yeasts, and wines broadens current understandings of the relations between materials and (work) practices in the context of agri-food and beyond. This thesis demonstrated that the capacity for skilled action is developed through interaction with the material world, and that this form of knowing is a key building block of organic wine production. This suggests that embodied and practical knowledge of working with plants, microbes and other living materialities should be an important avenue for further research in agri-food studies. While geographers and anthropologists have been keen to point out the embodied and tacit dimensions of the agricultural knowledge of marginalised cultures (e.g. Tsing 1993, Van Der Ploeg 1993), the importance of the same kinds of skills in Western agriculture continues to slip under the radar of current social science (although see Paxson 2008, and Williams 2011 on artisan cheese). While codified and abstract knowledge is increasingly relevant for agri-food production, we also need to reclaim agricultural work as skilled, and to better understand the ways in which these skills are acquired and communicated in different contexts. The interplay between acquisition, maintenance, and evolution of tacit and practical knowledges of agricultural work, and the materials of the field of agricultural practice, needs a more explicit recognition.

In spite of the depth of practical knowledge needed to successfully enrol the productive agency of the material world of agri-foods, in current socio-economic classifications agricultural work is not recognised as skilled work. This is symptomatic of the growing dominance of abstract and scientific knowledge in agri-food production, and the active marginalisation of local knowledge systems as legitimate ways of knowing agriculture (Fonte 2008, Siebert et al. 2008). The practical knowing of indeterminacy (Hinchliffe 2001) described in this thesis is not limited to organic winemakers. Artisan cheese makers (Williams 2011), or, in a non-food context, metallurgists (Barry 2010), have also been shown to 'work around' uncertainty, and to rely on embodied and experiential knowledge of the probable (not certain) evolutions of materials. A marginalisation of local knowledge as not only valid, but as absolutely necessary for the stability of agri-food systems, is not only politically suspect, but potentially environmentally dangerous. In the light of the need to practically deal with indeterminacy, and to prevent catastrophic externalities such as were seen in the case of the BSE crisis, a plurality of approaches to agri-food knowledge needs to be acknowledged, valorised, and explored.

The increasing standardisation and need for calculability (Callon and Law 2005) of modern agri-food systems means that local knowledge systems struggle to be recognised as legitimate ways of knowing agriculture. This can have consequences not only in terms of threatening local agri-cultures, but also in terms of environmental sustainability of food production. The dominance of abstract ways of knowing agriculture, with the related dependence on visibility and calculability, may have important negative consequences for the future of agricultural ecosystems. In a period of rapid and unpredictable climate change, loss of local knowledges relating to the growing and processing of crops can lead to a dependence on locally unsustainable ways of producing food. Practical knowledge cannot be re-learned from written accounts; once the practices of growing particular kinds of crops, or maintaining particular

local ecosystems, are eradicated, they are gone for ever. Recently, a need for knowledge-intensive and place-based ways of producing food has begun to be acknowledged (e.g. Horlings and Marsden 2011). Taking into account the oil- and water-dependency of modern agriculture, and the impact of climatic changes on the production of food worldwide, the importance of preserving agricultural knowledge as skilled practice acquires a new urgency.

A recognition of the centrality of materials to the acquisition and performance of skilled practice, which I have demonstrated in this thesis, need also signify a (re)turn and (re)appreciation of apprenticeship as a valuable and necessary form of training. My findings in this thesis suggest that we need to spend more time re-visiting the apprenticeship model, and recognising and valuing the methods for materials-centred knowledge acquisition in agri-food production, and beyond.

This thesis thus challenged the marginalisation of tacit, embodied, contextual, and materials-centred forms of knowledge in agri-food studies, and adds to a slowly growing body of literature on 'good materialists' (Barry 2010), that is experts who work with and are practically aware of the inherent dynamics and vitality of the material world in which their work is situated. Further engagement with theories of craft (Sennett 2008) could open up a fruitful area of inquiry into skilled work in agri-food production.

8.3.4 Modes of ordering and performative markets and ethics in agri-food

In my inquiry into the practices of working with the lively materialities of organic winemaking, I have argued that two modes of ordering of practices and discourses can be identified: making spaces for nature, and pacification. Both modes of ordering, I demonstrated, are involved in the (re)creation of ethics of production, and in the (re)creation of markets for organic wines. Importantly, the two modes perform very different ontological politics (Mol 2002), with pacification working towards predictability and standardisation, and making space for nature working towards unpredictability and diversification. As I have demonstrated in the thesis, the tension between vital materialities and human intentionality, and between the two ordering modes, is never resolved. It is a productive tension, and as a result both modes of ordering are crucial to the creation of the worlds of organic wine.

In this thesis I have thus argued that ethics and markets, and the materialities which contribute to their (re)creation, cannot be disentangled and treated as separate entities. Both markets and ethics are performative and relational, that is both markets and ethics are constantly made and remade in practices which involve both human intentionality, and the vitality of materials. This relational and performative perspective on ethics and markets challenges established understandings in the field of agri-food. It also proposes a radically different entry point for the critiques of agri-food systems, not through codified ethics, but through ethical relations with the material world. I discuss this point further below.

The tension between the two modes of ordering discussed in this thesis stems from the ongoing negotiation of acceptable levels of indeterminacy (and so the acceptable limits of 'naturalness') in organic wine production and sales. As I have shown throughout the thesis, indeterminacy is a constant and inherent element of working with lively materialities, and the challenges indeterminacy presents are addressed at all stages of production and sales. The impacts of this indeterminacy on the livelihoods of producers are directly related to the

character of the markets in which they participate and which they (re)create, and particularly the importance of calculability in these markets. An increase in the need for calculability at the market level always translates into important changes at the level of socio-technical practice at all stages of production.

It has been noted that, generally, the need for calculability has been increasing in agri-food production. The tension between naturalness/indeterminacy and calculability (and so the tension between the modes of ordering of making spaces for nature and of pacification), described in this thesis, can be seen to play out in all sectors of agri-food. As was mentioned above, this tension continues to be thought of in terms of the limits nature poses to the expansion of capital, and the methods capital develops to overcome these limits. As a result, many critiques of the agri-food status-quo continue to reproduce the idea of a passive nature which is exploited by the current (capitalist) mode of production, and which has to be 'saved' through ethical societal action. Ethical production is thus imagined as aligning production practice with top-down ethical codes, and ethics is conceptualised of as external to, and codified into products through processes of labour and marketing.

In this thesis, I have challenged this approach to ethics, dominant in agri-food literature. Stressing the relationality of ethics, I proposed a move beyond a dependence on prescriptive 'ethical codes' for the understanding of ethics in agri-food production. In contrast to most studies of alternative food markets, I argued that the ethics of organic wine production need not be seen as forged and expressed primarily with reference to codified ethical stances. Instead, I argued that ethics is always 'already there' in processes of production, and that while the individual ethics of producers enter in conversation with the codified ethics of their 'niches', their relationship is not deterministic.

In concert with many writers in the post-humanist canon, I thus argued that all action, including production, is inherently ethical. Production choices are onto-political choices (Mol 2002), in that they make ethical distinctions, and perform particular futures. However, the ontological politics of organic winemaking, I showed, was always, inextricably, the ontological politics of particular individuals. I found organic winemakers were motivated in their choices by a relational ethics, that is by the felt need to forge particular relations with the world of materials. Maintaining particular relations through winemaking practice was part of their ongoing work of ethical identity maintenance as particular individuals motivated by particular ethical concerns (be they biodiversity, financial viability, or producing 'the most natural wine in the world'). I thus drew attention to the figure of the ethical individual not as a 'translator' of ethical codes into local realities, but as a creator of ethical stances which are articulated in relation to, but also independently of, codified ethics of their 'niches'.

What could a turn to relational ethics of agri-food signify for those interested in a normative change in the practices of agri-food production? My research suggests that the calls for 'generous' living in a more-than-human world of agri-foods (e.g. Haraway 2007, Whatmore 2006, Whatmore and Thorne 1997) need to consider the importance of individuals' ethical identities, and their practical relations with the material world. I suggest that scholars interested in a normative change in the ethics of agri-food ought to further explore the figure of the relational human as a point of entry for ethical change. Latour (1993) memorably observed that the category 'human' has been predominantly constructed through exclusion on

the level of abstraction (subjects-objects), but inclusion on the level of practice (actor-networks). Forging connections with non-humans, he argued (Latour 2004b), is a natural element of what it means to be human. At the same time, how we chose to engage with the non-human world, who is allowed to speak in it, and on what terms, is the stuff of ontological politics (Mol 2002).

In the context of agri-food, I suggest that an enabling direction for normative ontological politics could lie in the stretching of the category 'human', and in embracing its relationality in such a way that a healthy and sustainable *telos* of more and more entities becomes necessary for the 'human' to (fully) exist. The current mode of producing agri-foods, which provides plentiful food commodities at low prices to consumers in the developed world, is based on the externalisation of its environmental and societal costs. The reaction of the social and environmental movements consists of attempts to change the regime of justification (Boltanski and Thévenot 1991) of agri-food systems from, for example, the industrial to the domestic one, valorising the protection of humans' 'natural heritage' over capital accumulation. In his critique of these approaches, Latour (1998) suggested that their weakness lay in their referring to the principle of common humanity as a bottom line ethical principle ('humanity is the measure of all things'). In line with the symmetrical thinking of actor-network theory, he argued for an opening up of the category 'human', and multiplying and problematising the attachments between the 'human' and everything else.

Scaling Latour's argument down to the question of agri-foods, I would suggest that an effective route towards a relational ethics of agri-food lies in exploring the political potential of the corporeal relations between consumers and foods.¹ In other words, it lies in exploring taste buds as constructive of both consumer identities, and of production practices. This idea of 'changing the world through the taste buds' currently finds its most explicit expression in the agenda of the Slow Food movement. Ethical goals, such as protecting cultural- and bio-diversity, and extending awareness of agri-food production practices, form the core of the 'slow' approach to consuming and growing foods. Hayes-Conroy and Martin (2010) suggest that by teaching the visceral practices of thoughtful eating, the Slow Food movement enrolls the bodies of food consumers to support particular ways of producing agri-foods. This alignment of taste buds with particular production practices is not a strategy only employed in such 'elitist' forms of eating, but forms the core of all eating practices. It is nothing other than the process of making foods edible, that is both socially and viscerally appealing. In his historical analysis of how mass-produced foods were made palatable to unconvinced consumers, Carolan (2011) argued that a similar alignment of palates and production practices is a key element contributing to the stability of the current agri-food status-quo.

These studies, and my work in this thesis, suggest a need for a deeper understanding of the relations between consumers' bodies and production practices through the medium of food. Promoting more generous and more sustainable ways of producing agri-foods may be more effective if we act on the level of palates, rather than canvassing on behalf of anonymous and alien non-human 'Others'. For a normative change in agri-food production, taste buds could be a good place to start.

¹ On inter-corporeality of foods see also Bennett (2007).

By keeping materialities firmly at the centre of an inquiry into markets and ethics, new points of entry for the critiques of the status-quo in agri-food production become possible. The times and spaces of agri-food production, and those of agri-food markets and ethics, I argue, must be seen as linked through the materialities of practice and product, and as constantly influencing one another. (Material) changes in the one sphere always translate into (material) changes in the other. As a result, strategies for local and sustainable ways of producing foods advocated in agri-food literature and policy today need to address both the material character of such production, but also the architecture of agri-food markets which would enable such production to flourish. The politics of sustainable agriculture must be a materialist politics, and it must propose processes of production and marketisation which would be capable of accommodating the indeterminacy which more 'natural' ways of producing foods cultivate. Considering the acknowledged importance of calculability to processes of marketisation (Çalışkan and Callon 2010), and the obduracy of capitalist markets, imagining markets which would (and could) accommodate indeterminacy at all stages is no mean challenge, but also one which is becoming increasingly urgent in the rapidly changing world of agri-foods.