

Chapter Six

Sulphur dioxide multiple



Fig. 6.1: Warning and instruction label on a container of oenological sulphur dioxide.

The substance was made up of small, white crystals, not unlike sugar. In the tiny dark room, crammed full of pipes, buckets and assorted winery instruments, I carefully measured out the required dose using kitchen scales and a wooden spoon. Then I added the substance to a plastic jug half-filled with wine, and stirred it for a while. Having climbed a precarious metal ladder, I balanced on a thin walkway above the four-metre high wine vats, and tipped the mixture into the one filled with wine we were about to filter with Severino. I heard the metallic echo when the stream of sulphur-enriched wine met the surface of the wine in the vat, and that was it. The cantina was silent again, the deed was done. The whole big deal. (based on field diary 10/02/2009)

6.1 Introduction

In organic winemaking, sulphur dioxide (SO₂) is multiple. In wine it is a physical substance, a material stabiliser of products, an agent with inorganic vitality, working in the darkness and largely unobserved. In the marketplace it is a facilitator of marketisation (Çalışkan and Callon, 2010) in a majority of markets and for the majority of wines. In ongoing conversations between market participants its latent presence is a discursive marker of 'commitment' to organic. In this reading, following Mol (2002), SO₂ emerges in practices. In an ethnographic reading which favours practices as the only truth accessible, reality multiplies (Mol 2002). In other words, '*ontology* is not given in the order of things, but (...) instead *ontologies* are brought into being, sustained, or allowed to wither away in common, day-to-day, sociomaterial practices' (Mol 2002: 6, original emphasis).

While in the previous two chapters I followed and examined the practices which incorporate organic, and therefore more commonsensically 'lively' and 'active' materialities of vines and yeasts, in this chapter I take a further step to consider the inorganic vitality of a chemical, sulphur dioxide. Where enabling the inherent capacities of yeast as creative and unpredictable resulted, as I argued in the previous chapter, in the making of space for nature in making organic wine, employing the inherent capacities of sulphur dioxide results in a closing of those 'natural' spaces through the pacification (or even destruction) of microbial activity. This makes sulphur dioxide a desirable element of practices which aim at obtaining easily marketable 'stable' and 'unproblematic' wines. At the same time, however, SO₂ is an undesirable presence, as its use goes against the principle of non-intervention key for the creation of a wine's 'naturalness', as was discussed in the previous chapter. In this chapter, I examine the practices and discourses which involve and perform sulphur dioxide. I tease out the conflicts and tensions between the two modes of ordering the worlds of organic wine, and engage with the ways in which this space of tensions is managed by wine producers.

In this chapter, I explore how the many performances of sulphur dioxide coexist, entwine and clash. I argue that sulphur dioxide is a material which is both pivotal and undesirable to organic winemaking, a substance which simultaneously enables (section 6.2) and threatens (section 6.3)

the organic wine market. The multiples of SO₂ I discuss in this chapter are the crucial ones for organic winemaking, as markets, as practices and as cultures. When talking about organic winemaking, we have to talk about sulphur dioxide as it is both a crucial contributor to organic (and indeed conventional) wine markets as we know them, and one of the main sources of ethical debate within the organic wine community.¹

The different ontologies of sulphur dioxide described in this chapter are the different practices in which it becomes entangled with human action – the bio-chemical practices of materially stabilising, the market practices of enabling, and the discursive practices of signifying an allegiance to a particular set of ideas about organic vitiviculture. These practices not only co-exist, distributed in space and time, but, in certain situations, clash and jar. Most notably, the ethical weight of sulphur dioxide overflows its material uses, shifting practices into ethical registers they were not meant, by those initiating the practice, to be occupying.

6.1.1 SO₂ as a precarious black box

‘For the thing we are looking for is not a human thing, nor is it an inhuman thing. It offers, rather, a continuous passage, a commerce, an interchange, between what humans inscribe in it and what it prescribes to humans’.

(Latour 1996: 213)

Wine, winemakers were always happy to tell me, is a living, dynamic entity. It is the history of the vineyard and of the vintage, it is the processes of the making, the machines and the bacteria, the enzymes and the yeasts. It breathes, it matures, it changes – it lives. Its liveliness, as was gleaned in the previous chapter (Chapter Five), and as I discuss in more detail in the following chapter (Chapter Seven), can be unpredictable – and this is where sulphur dioxide comes in. Thanks to its preservative characteristics, even in small doses sulphur dioxide allows the winemaker and the importer to sleep well at night, safe in the knowledge that the wines on which their livelihoods depend are not ‘going off’, or oxidising in the cellar. In the process of procuring this stability, SO₂ becomes ‘black-boxed’ and even actively silenced. And the stability and survival of organic wine markets, I argue, depends on the invisible, uncontroversial status of black-boxed SO₂.

The idea of a black box was developed by Latour in connection with the workings of science, which depends on the production of dependable ‘black boxes’ of facts and processes. Latour was inspired by cyberneticians, who ‘whenever a piece of machinery or a set of commands is too complex (...) draw [in its place] a little box about which they need to know nothing but its input and output’ (Latour 1987: 2-3). When we deal with ‘black boxes’, we deal with the effects of complex relations which have nonetheless become obscure to us, allowing a focus ‘only on its inputs and outputs and not on its internal complexity’ (Latour 2005: 304). Successful black boxes become established as

¹ It is important to say that the SO₂ debate is not limited to organic winemaking, although I argue that it is in the context of organic that its presence is questioned most intensely. As I discuss in the section 6.4.1, concerns over allergic reactions to SO₂ have led to compulsory labelling of all (organic and conventional) wines with a concentration of SO₂ above 10 mg/l as ‘containing sulphites’. Additionally, producers striving to make wines without any SO₂ are not always organic.

'facts', or 'immutable mobiles' (Latour 1987) and can travel widely and be accepted and deployed by a wide range of users.

In the following sections I argue that the black boxing of SO₂ is a key element of the socio-technical stability of organic wine markets, and a way of dealing with the tension between the qualculation imperative and the 'naturalness' imperative which lies at the heart of organic winemaking. This is a tension that the two key performances of SO₂ embody: on the one hand, its function as an enabler of pacification, and on the other the threat it poses to the 'naturalness' of organic wines.

Sulphur dioxide, I suggest, by silencing active bio-chemical components of wine, allows an easier disentanglement of a bottle of wine from the context of its production, and thus a quicker path towards marketisation. SO₂-heavy wine can be treated without consideration for its material vulnerability: it can be kept in the sun, stored on the supermarket shelf, or transported for thousands of miles by air and road and sea. At all the stages of a wine's journey from winery to table, the continuous inorganic vitality (Gregson et al. 2010) of SO₂ is working, unnoticed in its black-boxed state. Crucially, Latour (1987) noted, the successful existence of a black box is dependent on its uncontroversial status. But in the case of sulphur dioxide use in organic wine making, we are dealing with a precarious black box which is not yet resistant to counter-claims. The latent ethical presence of SO₂ as a morally uncomfortable material can lead to a dissolution of this black box, and the proliferation of controversies.

In the following sections I examine the different performances of sulphur dioxide in turn. I begin with an excursus into the history of its use, and consider its unexpected rise to popularity in spite of the push towards pasteurisation as a principal method for the stabilisation of wine. An interview with Ottavio provides some insights into the recent entry of SO₂ as an element of usual practices of making wine, while the history of the making of *Animae*, the first ever Prosecco wine produced without added sulphites showcases the number and extent of SO₂'s bio-chemical effects. In the second section, I further highlight the power of SO₂ as an enabler of markets as I examine the failed attempt at pan-European organic winemaking legislative framework. I argue the failure of the initiative was due to the focus on SO₂ as a necessary but undesirable presence in organic wine, which highlighted the dependence of a number of organic producers, particularly in the north of Europe, on the presence of this ethically uncomfortable chemical. In the final section I further tease out the ethical weight of SO₂ as a not-natural presence in 'natural' wines. I focus on the moments in interviews with producers where I unwittingly brought together the two incompatible performances of SO₂, as an enabler of markets and as an ethically uncomfortable material, and I examine how producers attempted to deal with this dissolution of the black box on which their wine making depends.

Box 1: Oenological uses of sulphur dioxide

This most useful of all additives has been known for centuries and a convenient way of obtaining sulphur dioxide is by using potassium metabisulphite, in the form of a white powder. Sulphur dioxide has become such a universal additive because it has four quite distinct properties:

1. prevention of oxidation: it will readily combine with oxygen, thus removing it before too much harm can be done.
2. antiseptic: sulphur dioxide kills with ease aerobic bacteria in wine through a two-pronged attack, by poisoning the bacteria and removing any remaining oxygen the bacteria need to thrive. The addition of sulphur dioxide before fermentation reduces the activity of wild yeasts and permits the wine yeasts to take over at an earlier stage, which gives a more consistent and thus more secure fermentation.
3. anti-oxidasic: sulphur dioxide acts as a poison to the oxidases enzymes, adding further to its antioxidant property.
4. corrective after oxidation: it can “freshen” tired wines which are suffering from a slight degree of oxidation.

Sulphur dioxide can be added:

- To the bins in which the grapes are harvested and transported to the winery
- To the juice or must prior to fermentation
- To the wine after fermentation and during storage
- To the wine immediately pre-bottling

The EU law prescribes the amount of total SO_2 present in wine at the end of the winemaking process (in the bottle). The permitted amounts vary according to wine types, and notably in relation to the presence of residual sugars. The allowed amount for dry red wines, for example, is 150 mg/l, while sweet wines made from grapes purposefully infected with the ‘noble rot’ *Botrytis cinerea* (e.g. Tokaj) can have SO_2 concentrations of up to 400 mg/l.

[from Bird (2010: 165-171) and Iland et al. (2009: 16)]

6.2 Ontology one: SO₂ in oenology

In this section I introduce SO₂ as an inorganic material the bio-chemical effects of which are crucial in the forging of its relations with humans in the context of wine production. Historical, scientific and not-so scientific accounts are used to show how SO₂ became and continues to be entangled with wine-making and wine-drinking humans.

6.2.1 Historicity of things: the birth of oenology and the emergence of an SO₂ network

'Matter is always already an ongoing historicity.'
(Barad 2003: 821)

One could say that the modern history of SO₂ starts with Pasteur. Pasteur's career as one of the greatest scientists of the 19th century grew out from his work in the winemaking sector. In 1854 he was appointed professor of chemistry at the University of Lille, where he worked with the local winemaking industry to establish the causes behind the souring of wine. In 1866 Pasteur published a collection of his studies on wine called *Etudes sur le vin. Ses maladies – Causes qui les provoquent – Procédés nouveaux pour le conserver et pour le vieillir*, in which he introduced the 'pasteurian cure' – the heating of liquids in order to kill bacteria. This discovery granted him immediate political and economic significance, as it was believed it would allow France to expand its market for low-alcohol wines and export widely (previously only fortified wines were robust enough to survive the trip from France to consumer countries). Pasteurisation as a method received a boost when it was taken up by the French navy, for which spoiling wine posed a serious problem on the ships sailing to the warm parts of the French empire (Paul 1996).

Pasteur's work united science, technology and agriculture in a new way, and gave birth to scientific oenology as we know it today, as he recognised that 'science, taste and production cannot be separated' (Paul 1996: 2). The reproduction of his scientific observations required the spread of laboratories so that the operations involved in the creation of facts could be reproduced at different geographical locations (Latour 1988). As a result, the greatest achievement of Pasteur's was not the pasteurisation, but the laboratoryisation (Latour 1988) – and not just of France, but of every discipline and trade he got involved with. Through his stress on the importance of laboratory methods for work in such diverse areas as winemaking, silk worm cultivation and cattle breeding, he transformed the issues concerning entire industries into laboratory questions (Latour 1988 : 69). Through a combination of scientific and political genius, Pasteur 'recruited his allies in this way, through the needs, desires and problems that he came in contact with, he maintained a discourse by which all the strength of what he did came from the fundamental research and the work of his laboratory' (Latour 1988: 71). The laboratory was crucial because, when translated into the laboratory setting, problems were finally made smaller than the men they plagued (Latour 1988 : 75). Regardless of the success of the laboratory network, the adoption of wine pasteurisation was hotly debated at the time of its development, and the controversy never ceased. With time, better machines were developed, and the many positive effects of 'flash pasteurisation' (lasting only a few seconds) are now known. Paul (1996) noted that the topic still

attracted some interest in the literature in the 1980s, but a decade later it had been all but abandoned.

While pasteurisation was aggressively pushed by Pasteurians as the universal cure for all wine's ills, it was always accompanied by the use of SO₂. Unglamorous, without a dedicated scientific propagator, it has not attracted a great amount of scholarly attention, and sadly there are no studies I am aware of dedicated to the history of the use of SO₂. We know it has been in use since antiquity, especially in the form of vapour from burning, used to sterilise empty containers. The history of its scientific, and thus oenological, use, however, is tied with the history of pasteurisation. The use of SO₂ certainly went through the same mechanisms of translation (from laboratory to winery) (Latour 1988) and tuning (between scientific and winery practices of its application) (Pickering 2005) as pasteurisation did. In the case of SO₂, this has so far not been documented.

With time, pasteurisation seems to have gently slipped from the winemaker's almanac, while SO₂ persists. Its persistence and its unheralded triumph over the pasteurisation method is a humbling reminder that 'humans do not master, conceptually or casually, either the entry of nonhumans into or their impact upon the human world' (Schatzki 2001: 10). The use of SO₂ at all stages of vinification and wine keeping has become popular only in the 20th century (Halliday and Johnson 2006). It seems it first started to gain in importance with the widespread use of grafted vines, after the *phylloxera* infection in Europe forced French vine growers to graft their vines onto the rootstocks of American vines, which were resistant to the disease. In the last years of the 19th century Curtel, a French botanist, concluded that wines made from the fruit of grafted vines were less tannic and less resistant to spoiling, and therefore advocated that the addition of SO₂, which used to be a precautionary measure, should instead be seen as essential (Paul 1996: 97). He further advocated regular checks of SO₂ levels in maturing wines. Thus the practice of SO₂ addition and monitoring became firmly rooted in winemaking. It became a strong actant, in that it acquired many allies – oenologists, laboratories, winemaking books, winery practices. This however would not have been possible had it not been for the pasteurisation craze, the resulting growth in research centres and laboratories, and the forging of strong links between science, winemaking and commerce. Unexpectedly, it was SO₂, not pasteurisation, which became a crucial link in these scientific and market networks.

6.2.2 Historicity of things: Ottavio's tale of Italian oenology in Piemonte

Italy was much slower than France to adopt oenology as a widespread practice, and the arrival of SO₂ into wineries is something some of my interviewees witnessed within their lifetimes. When oenology was being born in nineteenth-century France, Italy was still cooling from the heat of unification; the historical fragmentation of Italy, both politically and economically, left Italian oenology forever a step behind the Gallic cousin. Ottavio, one of the founders of the Valli Unite cooperative, started to make wine when he was eighteen, when, after the death of his father, he had to take over the family vineyards. He based his winemaking technique on what his father had taught him. 'Italy was no France', he said to me. 'What we knew about wine then was... very little,

a few very simple traditions passed on from generation to generation, often it meant making wine which was well not even very good...' (02/02/2009). In 1972, he laughs, he had never even heard of malolactic fermentation; amongst the farmers in the village, 20-30% of wine would spoil every year.² Having to keep an entire farm going, Ottavio could only dedicate time to the *cantina* on the rainy days. Work in the *cantina* was considered 'light work' back then, he remembers, something to be done after the proper work of working the fields and the animals. At that time, oenologists were expensive specialists employed only by big winemaking companies, and their services were unobtainable on the level of small wineries such as his. The wines produced by small winemakers were destined to be drunk locally, and were not made for ageing; today, Valli Unite wines travel the globe, and are kept in cellars all over the world. Even back then, Ottavio was eager to improve his wines, and he learned there was an oenologist he could see. This meant driving his wine samples to a laboratory in another town once or twice a year, for the basic analysis. Only three parameters were available: volatile acidity, total acidity and sulphur dioxide. The service the laboratory offered was similar to that of a pharmacy – they would produce a prescription, sell you the chemicals, and it was up to you to use them. That was then. Now times have changed, oenologists are cheap, and the cooperative employs Umberto who visits the company practically every week during the harvest, and once a month in other periods, and his laboratory regularly provides complex analyses of their wines and grape musts.

In contemporary wineries, conventional or organic, and even as small as the one at Valli Unite, SO₂ additions form a basic part of the vinification process. It can be added as the grapes are being crushed, to prevent juice from oxidising. However, usually the first batch of SO₂ is added after musting to slow down the development of 'wild' yeasts which have hitched a ride on the grapes and into the vat. The 'domesticated' *Saccharomyces cerevisiae* is preferred by most winemakers; this popular yeast strain forms the majority of yeast sold for wine fermentation, and has a higher SO₂ resistance than the 'wild', naturally occurring yeasts. Its fermentation work is also aided by the fact that SO₂ stuns other microbes and bacteria which may compete with *Saccharomyces* for the available sugars; winemakers especially fear bacterial activity which results in elevated levels of volatile acidity – noticeable as a vinegar smell – which is very difficult to mask once present in wine (for a full discussion of the role of yeast in winemaking see Chapter Five). From a method virtually unknown in the 1950s, SO₂ use has become one of the routine, although in some contexts contested, winery practices.

6.2.3 *Animae* and absent presence of SO₂

The extent of SO₂'s bio-chemical effects can be really appreciated when we see how many other actants it takes to replace it in a network for that network to function. What happens when we remove SO₂ from a wine-network which depends on it? We can see this on the example of the *Animae* Prosecco, a very unusual wine, made in a very unusual way. The owner of the producer company, Ivo, considered it the culmination of his company's scientific and product development. It was a unique product: the first sparkling white wine in the world to be produced without any

² Malolactic fermentation is a bacterial fermentation which follows yeast fermentation in the making of some wines. It is performed by lactic bacteria which convert malic acid to L-lactic acid.

addition of SO₂. For Ivo, the company's owner and the originator of the idea, this additives-free wine was an epitome of organic wine production.

Ivo: 'We started off from the first organic Prosecco, Perlage did the first organic Prosecco, then we did the first biodynamic Prosecco, and the natural evolution was that this biodynamic Prosecco should also be a Prosecco without sulphites. So it seemed to us that this would be a coherent evolution of an organic, biodynamic philosophy, to have a product that would be as complete as possible, without chemical interventions. So for us this has been an elaboration of an idea, and a great personal satisfaction. On the level of scientific satisfaction, it was a real victory, right, to be able to put into practice a, a, a sparkling wine which is as natural as possible.' (interview 02/08/2008)

'As natural as possible', at the same time, this wine could not be further from the romanticism often associated with the production of 'natural' foodstuffs. Performing 'nature' as a characteristic of *Animae* wine pivots on the exclusion of sulphur dioxide as an 'unnatural' (not-natural) chemical, but requires an involvement of a range of other, similarly not-natural artefacts. As a result *Animae* is a wine that comes into being through a series of complex cooperations involving laboratories, machines and microorganisms.

Box 2: Prosecco and SO₂ regulations

Sparkling white wines, due to low alcohol and high residual sugar levels (alcohol being around 11%, and residual sugars between 7 and 20 g p/l), are normally permitted to have quite high levels of SO₂ to be present (up to 235 mg/l); the availability of sugars and the low alcohol content make them especially prone to microbial contamination and oxidation. The SO₂ presence is not, however, entirely up to the winemakers and oenologists. The chemical is present in wine as a natural by-product of yeast activity in fermentation, and even without human intervention its levels can be as high as 40 parts per million. Thus, even not adding sulphur does not guarantee a sulphur-free wine. Both in the US and in Europe the limit of acceptability for this naturally occurring SO₂ has been fixed by regulations, and for a wine to carry a label "wine without added sulphites" it must contain less than 10 mg/l of SO₂.

The first problem the company had to resolve was the yeast strain used for the fermentation of this wine. Yeast is one of the agents responsible for the particular aromas and tastes of the Prosecco wine variety; not any yeast will do. In Prosecco, yeast carries out two rather than just one fermentation – the first to convert sugars into alcohol, and the second, in pressurised vats, to produce CO₂ and make the wine sparkling. The double fermentation means the yeast produces double the SO₂ levels of the still wines, thus bringing the levels of the chemical in wine above 10 mg/l, and preventing it from being labelled "without added sulphites" under current regulations.

And so Andrea, the company oenologist, had to 'invent' a strain that would allow them to avoid this problem. To this end, he collaborated with a biotechnology company Oliver Ogar. Their laboratories provided Andrea with yeast strains, and he performed experimental fermentations. In the end, a yeast strain which produces low levels of SO₂ was identified – but it was a strain used normally for the fermentation of red, not white, wines, and certainly not for the fermentation of Prosecco. This hybrid entity, a tailor-made micro-organism, could not have been further from the idea of a 'natural fermentator' such as 'wild yeasts' used by artisan winemakers discussed in the previous chapter (Chapter Five).

Ivo: 'So we had to involve a company that produces yeasts, and that would research yeasts that produce low levels of sulphur. (...) We have found an old yeast strain (...) However, there were immediate complications. Because, as I was saying earlier, for the making of Prosecco a special kind of yeast has been selected, which brings out particular organoleptic characteristics which are shared in the world of Prosecco experts. Using a different strain of yeasts, you also obtain different characteristics. (...) The second critical situation was that the first substances that oxidise are the sugars. So if I want the product to have a certain longevity in the absence of sulphites, I have to make it extremely dry. So this sparkling wine has 4 gm of residual sugars per litre. On average the most sold Prosecco, which is Extra Dry, has 18 gm per litre. (...) It is a product that represents a discontinuity.' (02/08/08)

The second issue, then, was at the level of taste. Prosecco, the most typical wine of the Veneto region, owes its characteristic sweetness to the high levels of residual sugars, sugars which, in the absence of SO₂, can and will attract bacteria, or cause the wine to undergo uncontrolled yeast fermentations in the bottle. Here again the oenologist moved away from the traditional course. Modern winery infrastructure in the form of temperature-controlled vats had to be used, as to keep the fermentation going the wine had to be kept at a higher than ambient temperature until an extremely dry wine was obtained, with only 4 grams of residual sugar p/l.

Avoiding sulphur dioxide and still obtaining a microbially stable Prosecco required the use of highly advanced vinifying and bottling machinery. In the absence of SO₂, the light white wine was also especially prone to oxidation. To avoid both these problems, the entire fermentation and bottling process had to be performed in the absence of oxygen, substituting it with nitrogen in the vats. Not only did this mean employing pumps, tubes, seals and pressurised gases, but also a new bottling machine, which offered the additional protection of a set of micro-filters to prevent a microbial infection should any air come into contact with the wine. Even in sales, more agencies are employed to ensure the stability of the wine: it is the only Perlage wine to be sold in a cardboard box (to protect it from sunlight), and additional storage instructions are spelled out on the side.

The particular version of 'natural' – a sparkling white wine which can be produced and maintained without the addition of chemicals – was only possible through a massive investment of time,

equipment and expertise. An impressive heterogenous network of agents had to be employed to re-distribute the competency of one material. As a result of all the translations, *Animae* is a very modern product. It is also a very expensive product; Andrea, Perlage's oenologist, points out that it would be impossible for them to produce all their wines in this way, as they would be simply too expensive for the market to absorb.³ The effects of SO₂ had to be distributed amongst yeasts, gases, machines and packaging, raising the cost, the level of difficulty, and in the process challenging the very nature of the Prosecco wine typology.

6.3 Ontology two: SO₂ as a facilitator of marketisations

'The point sounds trivial if applied asymmetrically. "Of course", one might say, "a piece of technology must be seized and activated by a human subject, a purposeful agent." But the point I am making is symmetrical: what is true of the "object" is still truer of the "subject". There is no sense in which humans may be said to exist as humans without entering into commerce with what authorises and enables them to exist (that is, to act).'

(Latour 1999: 192)

The material effects of sulphur dioxide discussed in the previous section have a direct consequence on its performance as a market agent. In their study of the mechanisms of market participation of goods, Çalişkan and Callon (2010) argue that the basis of a good's marketisation is its 'pacification', that is a material guarantee that the qualities of a good will evolve in a predictable manner. In the following chapter (Chapter Seven), where I engage with their argument in more depth, I argue that discursive and practice-base stabilisation can take the place of material pacification in particular organic wine markets. At the same time, however, I agree with Çalişkan and Callon (2010) that the principle of material pacification is implicit and explicit in the majority of economies of qualities. In the case of wine markets, pacification takes on a special importance, as the value and indeed the marketability of a wine depends on its capacity to 'hold on' to its qualities while it travels the convoluted and spatially remote networks of international wine markets. The case of *Animae*, discussed in the preceding section, and the case of Ottavio, discussed in section 6.4.2 of this chapter, both highlight the dependence of winemakers as market actors on the stabilising capacity of sulphur dioxide.

In this part of the chapter, I examine the stabilising effect of SO₂ in more detail, focusing on a high-profile controversy over European organic wine legislation. Many winemakers with whom I spoke stressed a need for unified EU rules on organic winemaking to ensure the competitiveness of the sector, and some of them actively participated in the research which was to inform it. The documents produced by the research into this matter conducted by the Organic Viticulture and Winemaking project (ORWINE), and by the legal drafting process which I focus on in the following section present a public face of a private and fragmented debate which continues to rumble in the European organic winemaking community. The public discussions examined in this section

³ At £13.99 the most expensive organic Prosecco on offer at the organic wine wholesalers Vinceremos.com (accessed 10/02/2012).

highlight the heavy dependence of organic wine markets, especially in the North of Europe, on the bio-chemical effects of SO₂. Importantly, this material dependence is incompatible with an uneasy ethical relationship winemakers have with SO₂ as a chemical and as an allergen. Organic wines, thus, depend on two, interfering (Law 2002b) practices: of SO₂ addition, and of SO₂ silencing. In the following section I argue that by opening the black box of SO₂ as a necessary but uncomfortable material in organic winemaking the ORWINE project sowed the seeds of its own failure. By bringing the usually invisible practice of SO₂ addition into the spotlight ORWINE disturbed the black-boxing process on which organic wine markets, especially in the north, depend. How the ethical discomfort of this dependence is felt by and dealt with, is further explored in detail in section 6.4 of this chapter.

In the following section, I examine the attempts at changing the material character of organic wine markets by the European Union through the introduction of an EU-wide organic wine production protocol, with a focus on limiting the use of SO₂ in wine production. I argue that the failure of this attempt was due to the double dependence of the organic wine markets: on the one hand, a bio-chemical dependence on the presence of sulphur dioxide, and on the other, a moral dependence on its silence as an ethically uncomfortable material. While in the context of individual wineries the two, seemingly contradictory practices of use and silencing of SO₂ are able to co-exist, their interference (Law 2002b) cannot be ‘distributed away’ in the context of legislation – or, as I explore in section four, in the context of an interview with an inquisitive geographer.

6.3.1 ORWINE and the pan-European organic wine legislation

At the time of writing, no pan-European organic wine regulation exists. European wines are labelled as ‘wine made from organic grapes’, which is seen by producers as a disadvantage versus New World wines, where the difference in regulations allows them to carry a potentially more appealing ‘organic wine’ label. Under pressure from the organic wine industry, the European Commission attempted to create a pan-European certification which would enable the presence of an ‘organic wine’ label on European wine bottles. The ambitions of the creators of the new certification went beyond the creation of a simple marketing weapon. Instead, and in the unitary spirit of many of the European Union initiatives, they conceived of it as a new, pan-European directive which would unite and homogenise organic winemaking practices across all European winemaking countries.

The scientific basis of the new legislation was to be rooted in the research undertaken by ORWINE, a purpose-created research group of 11 collaborators, coordinated by an Italian organic certification association AIAB (l’Associazione Italiana di Agricoltura Biologica).⁴ The project ran from

⁴ The research collaborators were: Dipartimento di Scienze degli Alimenti, Università degli Studi di Udine (Italy), The Università Cattolica del Sacro Cuore (Italy), VINIDEA s.r.l. (Italy), The Technical Institute for Organic Agriculture (France), Institut National de la Recherche Agronomique (France), The Wine and Vine Interprofessional Technical Center (France), The State Research Institute Geisenheim (Germany), The Federal Association of Organic Wine Producers (Germany), The Research Institute of Organic Agriculture Frick (Switzerland), and the IFOAM EU regional group (Belgium).

2006 to 2009. From its inception, the project had a particular interest in limiting the use of sulphur dioxide in organic oenology.

‘Sulphites reduction in wine processing is considered as a primary objective in oenology (...). Such a concern becomes particularly important for organic wine production (...) but it is valid also for traditional winemaking. Different strategies to reduce or to avoid the use of sulphur dioxide and of other additives not in line with the concept of organic agriculture in oenological practice will be evaluated both on laboratory scale and on-farm level. It will consider the principle of wine quality conservation and stability, not neglecting consumers’ health.’ (ORWINE www.orwine.org 11/01/2011)

6.3.2 ORWINE research: strong and weak SO₂ networks

Researching the possibilities for limiting SO₂ in organic wines was, from the outset, one of the main aims of the ORWINE project. The research confirmed that this initiative was supported by organic winemakers in Europe (Micheloni et al. 2007). However, at the same time, ORWINE noted that the intensity of SO₂ use differed between countries, with Germany, France, Austria and Switzerland being the most dependent on SO₂. In their report, the researchers stated that ‘In these countries, due to different climatic conditions as well as disease type and frequency, SO₂ addition must be considered differently as compared to warmer countries.’ (Micheloni et al. 2007 : 51). Thus from the very beginning a distinct geography of sulphur dioxide use was made visible.

A series of laboratory and on-farm experiments followed in which researchers sought to achieve micro-biologically stable and good quality wines with low SO₂ levels through the introduction or alteration of a number of winemaking technologies. In other words, the researchers sought to reproduce the stabilising effects of SO₂ through different means. The experiments uncovered some parts of the complex network of socio-chemical independencies which enables SO₂’s stabilising effects.

In a nutshell, researchers found that no single chemical component or technology could achieve the same overall effect on wine as sulphur dioxide. Instead, they found that to achieve similar (but not the same) effects, a number of different and targeted techniques had to be used (such as in the case of *Animae*). To give an example, lysozyme, an enzyme obtained from eggs and present for example in human saliva and milk, could be added to prevent unwanted lactic bacteria activity. Its addition, however, did not prevent the activity of other kinds of bacteria, or wine’s oxidation, at the same time. In all the cases, the techniques explored by the researchers had effects only on a particular wine component, and in particular conditions, whereas SO₂ acted ‘across the board’. Furthermore, it was found that some of the techniques had potential negative effects on wines (in the case of lysozyme, for instance, a risk of discolouration), and overall, in comparison with SO₂, their use required advanced technical knowledge, and, potentially, infrastructure investment. Importantly, the researchers also found that some of the methods, while successful in keeping down the necessary levels of SO₂, impacted on the organoleptic characteristics of the wines, thus changing their character (Trioli and Hofmann 2009).

In their final recommendations to the European Commission, the ORWINE research team concluded that limiting SO₂ levels in organic wines in Europe was indeed possible (Jonis and Micheloni 2009). However, they noted that not all organic wine producers were supportive of this change – for example, all organic wine producers in Germany were against any limitation of SO₂ levels. On the contrary, most French and Italian producers argued significant SO₂ reduction was feasible. While the possibility for limiting SO₂ existed, a fear was voiced by producers that limiting SO₂ in absence of alternatives could lead to a deterioration of sensorial qualities of organic wines, and a further loss of consumer confidence (consumers are already wary of organic wines and perceive them to be of low quality) (Jonis and Micheloni 2009). Furthermore, the ORWINE team noted that reducing SO₂ levels would have to result in trade-offs with other oenological practices for some winemakers: for example some may have been forced to change their oenological practices and use selected, rather than indigenous, yeast strains, or control fermentation temperatures. As shown by ORWINE wine tastings, using such techniques resulted in wines which tasted different to those obtained following the wineries' usual winemaking protocols.

In other words, it was found that while limiting the use of SO₂ in the making of organic wines was possible in principle, not only would it have required a dramatic change in winemaking practices, but it would have further impacted on the sensorial characteristics of the wines. Importantly, the limiting of SO₂ levels was not accepted by organic winemakers in all countries, especially in those where the unfavourable climatic conditions and the impact of grape illnesses were more pronounced. I argue that the reason for this resistance was the stronger dependence of the wine marketisation networks in these countries on the presence of SO₂.

6.3.3 Testing material networks. The attempted legislation.

Following the final ORWINE report, work on the new EU organic winemaking legislation started in April 2009, and was performed in collaboration with key stakeholders, one of which was the International Federation of Organic Agriculture Movements Europe (IFOAM EU) group. Throughout the legislation drafting processes, the EU Commission was in correspondence with IFOAM, which in turn conducted internal consultations with its members and internal wine experts as well as the IFOAM EU Group board. From the outset the issue of SO₂ reduction was the most controversial one for the IFOAM members. In the position paper on organic wine processing from 25th September 2009 the group stated:

‘The issue of sulphite reduction remains the most controversial for the organic sector and the discussion needs more time (some countries favour strong reduction of up to 50% whilst other countries are in favour of no reduction at all). (...) We urge the EU Commission to recognise the sensitivity of the issue and to carefully consider the different options.’ (IFOAM EU Group 2009a: 3)

In the document it was stressed that the proposed 50% reduction in SO₂ levels (vs. current country-specific levels) was not acceptable, as it would not allow organic wine production in all EU

wine regions. In the IFOAM EU position paper of 28th October 2009 a concern was expressed that ‘this [proposed reduction] would force organic wine producers out of business.’ (IFOAM EU Group 2009b). In a revised draft the EU Commission reduced the proposed SO₂ limit to current country-specific limit minus 50 mg/l (EU 2009). This, however, continued to be unacceptable to German, Austrian and Dutch organic wine producers (IFOAM EU Group 2009c). In spite of this, in the European Commission’s draft proposal from April 2010 the legislation continued to require a 50 mg/l reduction, and suggested those producers who could not meet this standard continued using the ‘wine from organically grown grapes’ label for the time being. The IFOAM members wholly rejected this proposal, and finally on the 16th June 2010 the EU Commissioner for Agriculture & Rural Development, Dacian Ciolos, withdrew the draft proposal from the process for good.

In the process of drafting the proposed legislation, and in spite of the information provided both by ORWINE researchers and market participants the production of wines was dissociated from their marketisation. As will be further discussed (in section 6.4), the reasoning behind the use of SO₂ is not limited to its effects; instead, the practices of SO₂ use are directly linked with the construction, philosophy and market identity of an organic winemaking company, and with its market involvement. Secondly, and in spite of the contrary voices emerging from ORWINE’s research, the legislators proceeded to address the organic wine market as a single entity. Instead, as will be illustrated in the following chapter (Chapter Seven), there is no such thing as a singular market for organic wines. There is a multiplicity of markets, ‘one for each actor’ (Callon 1998). On the level of legislation, the ecological and geographical differences, and the resulting differing dependence of organic wine networks on the presence of sulphur dioxide, lead to the emergence of a variety of market and regulatory needs.

For some wines, and thus for some markets, the effects of SO₂ emerge as an indispensable part of the marketisation process, whether due to the material stability needed to survive long journeys to final consumers, or in order to achieve particular taste characteristics. This diversity of markets is a result of the diversity of actor-networks of production. In the case of certain wines, SO₂ can be taken out of the socio-technical *agencement* network, and its effects distributed between other participants in that network – fridges, yeast strains and CO₂, for instance, as was the case with Perlage’s *Animae*. In agreeing to a 50 mg/l reduction in SO₂ levels, French and Italian producers were communicating the robustness and/or flexibility of their production and market networks in the face of the diminished effects of SO₂. The network changes, but survives. In the case of other wines, such as organic wines produced in the North of Europe, the effects of SO₂ cannot be so easily re-distributed. Without sulphur dioxide curtailing outside agencies which seek to enrol parts of the wine-network (e.g. bacteria seeking to dominate the yeast, oxygen acting on compounds in wine and turning the wine brown) the network does not survive. In these networks, the SO₂ is irreplaceable.

6.3.4 SO₂ and market participation: spatiality

The attempt at creating a unified EU organic wine legislation was compromised by the ecological variation between winemaking regions in Europe, and the consequent varying dependence of their

winemaking and wine-marketing networks on the effects of sulphur dioxide. The achievement of material stability necessary for the involvement in international wine markets involves a large number of bio-chemical processes, and it is not only SO₂ that plays a part in this process. The presence or absence of fungal and bacterial diseases in the vineyards, directly linked with the climatic and weather conditions; the type of grape used; the cleanliness in the winery; the length of fermentation, and countless other variables play a part in determining how prone the final product is to microbial infection and oxidation, and therefore how capable it is of holding on to its characteristics in market situations. This in turn determines what kinds of markets can be created for, or can absorb, the particular wine. Heavy, robust reds of the South are able to remain stable with lower amounts of SO₂ than delicate, sweet whites of the North, for example. As a result, the rules for the participation in markets which depend on wine's stability are place- and vintage-specific.

It is impossible to generalise the effects of SO₂ over the entire European organic wine production as SO₂ is a material agent in a particular, local actor-network of a particular organic wine, and how strongly this particular network depends on SO₂ for its (material) survival and (market) performance – i.e. how strongly it is connected and with how many other actors of this network – can only be judged in the local and temporary context (the situation changes with each vintage and each wine). Instead of market participation of organic wines everywhere depending on the same mechanisms, there exists 'a multiplicity of practical forms of confrontation between supply and demand' (Callon and Muniesa 2005: 1240). SO₂, considered as a sum of its effects on the wine, most notably its stabilising effect, is not just a prop, a 'neutral tool' which allows for market participation. Instead, it actively influences the structure of the markets in which it participates; in fact, in the absence of both SO₂ and alternative sources of its effects, some of these markets are threatened with extinction. SO₂ is a powerful agent. The EU's attempts at producing a spatially homogenous organic winemaking protocol although perhaps necessary, suffered critique from both the "hard-line" organic producers, who saw it as too lax, and from the "moderates", who objected to its restrictiveness. As often happens, the compromise turned out to be a solution where both parties got what neither of them wanted.

6.4 Ontology three. The latent ethical presence of sulphur dioxide

'When I think of a pasteurised, sterilised wine, it's death, at that moment you kill everything that had happened before...'

(Alessandro, winemaker, Valli Unite, 07/10/08)

While the previous two sections looked at material effects of SO₂ in wine making and wine sales, in this section I examine the ethical impact of SO₂. The effects SO₂ can have in the ethical domain were already gleaned in the previous section on the attempted EU-wide organic winemaking protocol. There I suggested that the ORWINE research project, and the legislative project which followed, disturbed the usual co-existence of two conflicting practices: of SO₂ use and of SO₂ silencing. In bringing them together in one discursive space, the projects ended up questioning the ethical legitimacy of wines which depend on the bio-chemical performance of SO₂, and threatening

their markets with closure. In this section, I take a closer look at the 'ethical baggage' of SO₂, and at the (sometimes unsuccessful) practices of distribution and silencing of SO₂'s ethical presence.

The ethical weight of SO₂ is an important element of the material discursive construction of difference between organic and conventional winemaking. In both discourse and practice, organic vitiviniculture is positioned as an 'alternative' or 'Other' to the conventional agriculture. While organic values and practices differ between producers and are not by no means coherent, they nonetheless 'tend to challenge both conventional agriculture and capitalist, non-sustainable production more broadly' (Mansfield 2004: 218). Organic is a movement founded on difference, and that difference is both codified in regulations and certifications, and performed in material practices of organic wineries. In the context of organic production, all material practices have to be positioned in relation to the core organic values, such as naturalness – but those positionings, those ethical categorisations, are always local and contextual. In choosing some practices over others, organic producers are involved in a 'politics of what' (Mol 2002), performing, practically and discursively, alternative ways of doing agriculture, and, as was explored in the previous chapter (Chapter Five), creating space for nature.

As a result, sulphur dioxide 'talk' stirs up powerful emotions amongst producers. The social history of SO₂, as well as its bio-chemical effects, mean that distancing oneself from SO₂ or, to the contrary, explicitly embracing its use, are not just material performances. They can instead be interpreted, by organic winemakers and wine-drinkers alike, as ethical statements of a person's 'winemaking philosophy'. These ethical discourses are constructed not in relation to abstract ideas, but in relation to moral material engagements with the world (Barad 2007). This is ontological politics in action. The material practices of SO₂ use, and the discursive practice of ethical positioning (Holloway 2002) versus SO₂ can both co-exist and clash. The way that SO₂ is used in the winery can in certain situations spill over into the discursive domain to be interpreted as an ethical statement – a statement of what organic winemaking is, and of what it should be. Thus, in the context of organic winemaking, material engagements with SO₂ have a profound ethical dimension, as they serve to constitute ethical difference not only between organic and conventional, but also between various 'shades' of organic.

Importantly, the SO₂ debates occur in the highly moral and moralising milieu of organic production, which facilitate the overflow of the ethical dimension of SO₂ use from material to the discursive. As a result, organic winemakers are always vulnerable to a latent ethical presence of the material. Sulphur dioxide is both material (chemical), economic and cultural. Sometimes it is just one – but sometimes, in certain settings, in certain conversations, it is all of these at once – and together those performances are not commensurable. This ethical resistance to black-boxing means SO₂ can never be 'just a chemical', its meanings always overflow, making it 'more than one and less than many' (Mol 2002: 82). The ethical weight of SO₂ has the power to undermine producers' attempts at constructing ethical identities as 'organic winemakers'. They may find themselves held accountable for their actions through the latent ethical weight of sulphur dioxide.

In the following section, in contrast to Bennett (2001), and following Gregson et al. (2010), I demonstrate that engagements with materials are not only celebratory and self-affirming, but can instead be problematic, upsetting, and challenging. Materials such as SO₂ have the potential to disrupt our discourses of identity formation through their latent ethical presence. I thus consider representational stability of producers as an ongoing project, always open to the ethical impact of those materialities they seek to distance themselves from and contain. I demonstrate that organic wine producers feel themselves vulnerable to the constant potential ethical impact of the material practices they employ in the winemaking processes, and that they are more vulnerable to this impact due to the context of their production – the moral and moralising space of organic markets. In this context, the latent presence of SO₂ always has the potential to become ethically activated, and to disrupt the process of ethical identity formation.

6.4.1 Organic and sulphur dioxide: an uncomfortable relationship

Anna: 'So what is your concept of being natural, of nature?'

Ivo: 'Yes, well, I understand the twist in this question, because there are certain processes in which we exclude natural processes, but only because we want to have control over some of the developments. But we are convinced that it is only via this route that one obtains maximum quality. I would say that... ehm... for us the concept of 'natural' is all that one can obtain without the help of chemical ingredients, that is without interferences of objects that are not natural, but are something that conserves the quality, or makes the quality better in a way that is artificial. That is why the sulphur is considered an interference, right, because it is a chemical substance that helps us obtain results, but it also has its consequences, it is an allergenic substance, so if we can use less of it, let's do it... I don't know if that's clear.'

(interview with Ivo, Perlage, 01/02/08)

The challenge facing organic producers is the unavoidable positioning of all material practices they engage with in the context of the ethical discourse of organic production. Some material practices, such as the use of SO₂, are more difficult to categorise than others, and their categorisations cause more of a controversy.⁵ In the above excerpt from the interview with Ivo, the owner of the company Perlage whose sulphite-free Prosecco was discussed in section 6.2.3, we find him caught between two performances of SO₂: as an enabler of marketisation on the one hand, and as a discursive marker of allegiance to certain ideas about organic winemaking on the other. On the one hand, sulphur dioxide is necessary to enable the marketisation of most wines, be it through the ensuring of market-recognised quality, or through the bio-chemical stabilisation for transport. On the other, as a chemical and as an allergen, it occupies an uncomfortable position within organic winemaking ethical discourse. The drive towards production of wines without added sulphites

⁵ The controversy surrounding the use of SO₂ can be interestingly contrasted with the generally accepted and very rarely challenged practice of using copper to spray vines against mildew, which results in the accumulation of this heavy metal in the soil of the vineyards. This is discussed in section 6.4.3.1 of this chapter.

amongst organic winemakers, as well as the stress on limiting SO₂ use in the planned EU organic wine production rules, point towards an uncomfortable placing of SO₂ as a necessary, but in principle unwelcome material in organic practice.

There are three connected sources of anxiety about SO₂ use. Firstly, sulphur dioxide, while occurring naturally in wine as a by-product of alcoholic fermentation, is generally used in the form of a synthetic chemical. And in the discourse of organic food production, chemicals occupy a particularly negative space. This derives from the organic movement's critique of the perceived over-dependence of agriculture of the use of synthetic chemicals. The organic ideas really came to the fore during the agricultural crisis between the two World Wars, when the dramatic fall in crop yield and the degradation of the soil needed to be urgently addressed both in Europe and in the USA. The use of mineral fertilisers and pesticides and farmyard machinery were seen as a solution to the crisis by most groups, while the organic movement proponents saw them, conversely, as the causes of these problems (Vogt 2007). Critical of mineral fertilisers, the organic school pushed instead for a return to organic manuring and creation of hummus in the soil to recreate fertility. To this day, the principle of substitution of synthetically obtained with naturally obtained chemical structures unites the various approaches to organic farming.

The bio-chemical effects of SO₂, which were discussed in section 6.2, are also controversial in the context of organic ethics. SO₂ is seen as a chemical interference into naturally occurring processes. As the quote from Valli Unite's winemaker Alessandro illustrates, the ethical weight of stabilisation can be a source of unease – for Alessandro, sulphurising wine means rendering it 'dead', obliterating both the fingerprint of the winemaker, and the natural agency of wine itself (for a full discussion of wine's liveliness see Chapter Seven). As was explored in the preceding chapter (Chapter Five), in organic production, Nature is generally represented as 'an independent state' (Hinchliffe 2007), sealed off from human action but always threatened with invasion, and thus in need of protection. Making space for nature is an inherent element of organic practice, and one which using sulphur dioxide annuls: using a chemical agent the primary function of which is to bring natural processes to a stop can be interpreted as an invasion *par excellence*.

Additionally, SO₂ is known to cause allergic reactions in some people, which is problematic when we consider the explicit association between organic agriculture and the health food movement. With regards to wine, in their research ORWINE noted that the minority of consumers who are knowledgeable of the presence and the role of SO₂ in wine link it with health problems and headaches, and consider it not to fit with the 'natural' image of organic wine (Stolz and Schmid 2007). The allergenic effect of SO₂ first led to legislative measures in the USA where, since 1986, all food and drink products with a concentration of SO₂ above 10 mg/L have to list its presence on the label. Europe was slower to react to those health concerns, but in 2005 the European Union directive 2003/89/CE included SO₂ amongst allergens whose presence must be clearly indicated on the product label. SO₂ is thus strongly positioned as an unhealthy material, which clashes with the image of organic as both natural and wholesome (Guthman 2004). The threat to consumers' health is a challenge for an industry whose products are mainly purchased for their perceived health benefits (e.g. Cerjak et al. 2010).

In the realm of ethical discourse of organic winemaking, the material effects of SO₂ on both human bodies in the form of allergies, and on non-human bodies as a stabiliser of natural processes, become problematic. These discursive contexts make SO₂ an ethically uncomfortable material. At the same time, as a bio-chemical stabiliser, and as an enabler of marketisation, it is a very convenient and effective material indeed. However, the two practices of SO₂ use are not commensurable – the marketisation requires an embracing of SO₂, while the creation of an ethical identity as an organic producer requires a distancing. The pacification of this controversy is usually achieved through distribution (Mol 2002): sulphur dioxide is embraced in the winery, but distanced in the official market discourse. The public's ignorance of the role of SO₂ in wine, combined with the purposeful exclusion of the presence of SO₂ from official organic wine discourse renders the substance ethically invisible. The unease of dealing with SO₂ in the context of organic winemaking becomes communicated during in-depth interviews, when an inquisitive geographer brings the two henceforth distributed practices together in the context of one conversation.

6.4.2 The unease of dealing with SO₂. Ottavio and a ruptured ethical identity

In this section, I consider the power of SO₂ to disturb the work of ethical identity construction. Ottavio's case is particularly interesting, as he found engaging with SO₂ and witnessing the effects it had on his wines and as a result on his identity as an organic winemaker so disenchanting he decided to abandon winemaking all together. Throughout my time at Valli Unite, I observed Ottavio's gradual withdrawal from the day to day running of the *cantina*, and the passing on of his knowledge to Alessandro, who begun making wine at Valli Unite just two years earlier, and whose second independent vintage I had a chance to witness.

Ottavio: 'The *cantiniere* every time he uses, a good *cantiniere*, every time that you use a small packet of yeast, every time you add something to wine you do it unwillingly. You have an urge to do it in secret, even when it is a product that you know you can use in organic wine making, but, you would rather not, it goes against... But you do it, because there is a market, you have to stay in the market, you do it because, exactly, the market is more selective... You are convinced that you need... You need some compromise, with the idea of completely natural. (...) For example, I can say that I did wines without sulphites until '91, without added yeast until '98; and then I had a whole series of problems, and I understood that I was putting at risk even the economy of the cooperative. (...) So I could not manage to move the wines without sulphites, it (...) Than, this wine was not always the same, it changed more often than the other ones, I would say that it changed with the moon, right, in the sense that depending on the moon it behaved in one way or the other [laughs]. At a certain point I asked myself if I was not risking too much, right, so I went back, I took some steps back, which was also something in inverted commas ugly for me, something that made me disenchanting a bit with the work of the *cantiniere*, because I was not able to make them without sulphites, but at the same time

calibrated, exactly like they should be... (...) And that was a bit... (...) That's when I understood that I had to dedicate a bit more to the soil, the contact with the soil, which fortunately has remained the same over the years, right, this does not change according to the fashions of the moment. It has different rhythms, other tempos. (...) (03/10/08)

In describing his ethical unease with using sulphur dioxide Ottavio is not referring to the codified ethical standard of organic certification, but instead to his internal moral standard, according to which wines are best made with minimal human intervention (this is similar to the ethical positioning of artisan winemakers versus the use of 'wild' yeast discussed in the previous chapter). This recalls very strongly the mode of ordering which results in a making of space for nature, discussed in Chapter Five. Failing to marketise his 'natural' wines, and with the weight of keeping the cooperative afloat on his shoulders, Ottavio decided to introduce the material practice of SO₂ addition. In this choice he was motivated by the material effects of these practices – stabilisation and standardisation, and the linked effect of enabling easier marketisation. However, these same bio-chemical and economic effects carried an ethical baggage when considered in the context of organic ethical discourse, and Ottavio's own moral standard of winemaking. Introducing SO₂ meant, for Ottavio, taking a step away from his ideal of a fully 'natural' and personal wine, a move which made him disenchanted with his work. Introducing SO₂ use did not fit with the kind of winemaker Ottavio wanted to be, and eventually resulted in his withdrawal from active winemaking, and a return to focusing on less ethically contested spaces of vineyards.

What Ottavio's case shows is the disruptive, rather than the affirmative power of materials in the work of ethical identity construction. This and the following examples are all instances when two practices – the practice of SO₂ as an enabler of marketisation and the practice of SO₂ as an ethical material – interfere (Law 2002b). Caught between the two practices, between the need to marketise the wines, and the ethical pull of a particular vision of organic winemaking, Ottavio opts out, and from winemaker becomes a vine-tender. In the following section, I consider two more instances of the clash of SO₂ practices, and examine different ways in which my interviewees sought to pacify the ethical controversy which was created in the context of the interview.

6.4.3 The unease of dealing with SO₂. Changing the conversation

'Irony is about contradictions that do not resolve into larger wholes, even dialectically, about the tension of holding incompatible things together because both are necessary and true.'

(Haraway 1991: 149)

In the following section, I consider the producers' various attempts at a discursive stabilisation of SO₂'s uncomfortable ethical pull – attempts at changing the terms of the conversation. In the following two examples the latent presence of SO₂, and consequently its latent ethical weight, make themselves felt due to a change in the usual distribution of the SO₂ practices brought about

by the context of an interview. In an interview situation, the SO₂ becomes visible and available in a discursive way, and so the practices of its use become vulnerable to ethical questioning.

In the following examples I look at this latent ethical power of the practices of sulphur dioxide use in the context of organic winemaking. The two producers discussed struggle to contain the ethical activity of SO₂ by contesting the terms of the ethical discourse and offering competing spatial definitions of nature (is winery nature?) and competing definitions of value (is naturalness a value?).

6.4.3.1 Daniele: spatialising ethics

'If you don't like what's being said, change the conversation.'
(*Mad Men* 2009⁶)

Daniele was an owner and the principal winemaker in a middle-sized organic winemaking company in Veneto. Before we sat down in his comfortable tasting room he showed me around the modern, mechanised and temperature-controlled winery. Daniele's view on the use of sulphur was different from that of Ottavio's, and he brought in the health of the consumer and the quality of the wine as arguments to support his ethical position on the use of SO₂ in the winery. Daniele's opinion is especially interesting as he was one of the producers advising ORWINE on the practicality of SO₂ reduction. In his winemaking, Daniele added 'very little sulphur', but at the same time confessed he had so far not been able to produce a stable, long-living wine without the addition of at least some SO₂. As he described the motivations behind the use of organic methods, Daniele uncovered the 'marketing talk' (or 'the public face') in the company's approach to sulphur dioxide.

Daniele: 'There is an important part, which is more for the media, but is used, it's used as marketing for the sales department: Which does more damage, a healthy product which is conventional, an organic wine, or a polluted organic wine. That is, (...) there is a lot of talk of using drinks without sulphur. We have all ganged up against the wine, forgetting that sulphurs are in any sweet drink. (...) Sulphur is a preservative, it protects [wine from] bacterial pollution, and from strange fermentations. So, does a healthy product with low sulphur levels do more damage, we are talking about quality, we are talking about effects of the health, or a wine that has very little sulphur, but that has in it polluting bacterial, enzymatic processes that may cause damage to the organism. (...) As far as I'm concerned, the more damaging is a wine without anything, but that is spoiled, a sour wine, a wine that became vinegar, a wine that has some strange malolactic re-fermentations that are not controlled, for sure it is more damaging than the wine with a little sulphur, but healthy.' (31/07/08)

In Daniele's opinion, the use of sulphur in the winery was justified by the consideration for the health of the consumer, thus moving away from the organic movement's idea of nature free of

⁶ Love Among the Ruins, *Mad Men*, Season 3, 2009 [DVD]

human interference as a source of health. SO₂, Daniele argued, stops unwelcome natural developments, and therefore its use is ethically justified. For Daniele, wine needs to have 'all the parameters under control' (31/07/08), and he drew a strong distinction between himself and biodynamic producers.⁷ While the respect for the land and ecosystems engrained in the biodynamic approach is something Daniele held dear himself, he saw the biodynamic practice in the winery – that is, the exclusion of modern winemaking practices, including the use of SO₂ – as 'going off into crazy things' (31/07/08).

Throughout our interview, Daniele drew a very strong distinction between the work in the winery, and the work in the vineyard, and categorises the practices occurring in those two spaces as falling into two different ethical registers. For instance, the logic of using a chemical aid to achieve a 'healthy' product in the winery did not apply to Daniele's vision of ethical practice in the vineyard. At the moment of the interview Daniele's vineyards were infected with mildew due to a rainy summer. The only preventive treatment against mildew in organic viticulture is copper spraying; the copper, however, is washed away from the grapes with every rain, and so requires constant re-application. As copper is a heavy metal, one which accumulates in the soil, Daniele sought to limit the amounts used in the vineyards.

Daniele: So, this year is a year, especially for you! (laughs), we started off with a very rainy vintage, it rained all the time, and we had to make some additional treatments. Being organic means being prepared that in difficult years you will lose some of your production. When we go to walk in the vineyard, from here you can't see, but you will find some grapes on the bunch that are dry. This is a small attack of downy mildew, just after the flowering, which has taken, we have estimated, 8-10% of the production. Which is very little, but there is. We have lost the product, no-one will pay for this. But being organic means respecting the plants, it also means this. It's no use that I should continue to throw down products, copper or other. A limit on copper is known by now, it's there. If it rains every day the copper does not manage to stay on. You have to be conscious of the fact that you may lose even ten percent of your product. (...) But being organic means also that. In the mentality of the conventional, this is not accepted. You have to always produce the maximum. Therefore if there is a problem, it is fought, with chemicals, and that's it. It's the philosophy. This is why before I said that to be organic is a way of living, it's an ethical choice. It's not only a choice of production, economic choice. It is the completely opposite. (31/07/08)

Daniele stressed how, in the vineyards, losses are 'part of the game'. The same logic, however, did not apply to the cantina – there the wines needed to be stabilised, and 'problems were fought with

⁷ As was already mentioned in the previous chapter, biodynamic, just as organic, is an umbrella term for a wide range of practices. However, for many of my non-biodynamic research participants 'biodynamic production' was a short-hand for 'reckless naturalism', and abandonment of cause-effect reasoning in wine making.

chemicals', a strategy Daniele discounted in the vine-keeping practices. In our conversation, Daniele was re-directing the 'is it ok to use sulphur' dispute, and changing it into the question of where the moral organic practice really takes place – is it in the vineyards, or is it in the cantina?

The organic ethical ban on interference in nature does not apply when the space of the winery becomes excluded from the realm of natural processes. Similarly to Mansfield's cases of catfish and spaces of cultivation (Mansfield 2003, 2004), it turns out that what counts as natural and what counts as organic has to do not with inherent meanings, but with the drawing of conceptual categories. When spaces are classified as different, and belonging to different ethical registers, they enable the silencing of potential ethical controversies through a spatial distribution of practices. Spatial differentiation becomes a means of creating ethical difference. By drawing a distinction between the vineyards as places free from (some) chemicals, and wineries as a place where those chemicals are allowed (within reason), winemakers 'produce geographical imaginations that are about distinguishing one kind of place from another based on cultural economic practices that make distinctions about nature' (Mansfield 2003 : 330). Some producers, such as Angiolino and Walter discussed in the previous chapter, extend the category 'nature' to encompass the winery, and thus seek to exclude chemicals from that space. Others, like Daniele, draw a line between soil and winery, and limit their husbandry of natural processes to the vineyards. These distinctions are spaces of contestation, and the categorisation is always disputed and local.

In my view, in drawing a distinction between vineyards as realm where certain processes are 'allowed to happen' and winery as realm of 'stable parameters' Daniele was seeking to silence the ethical potential of SO₂ as an anti-natural material; indeed, he re-contextualised SO₂ in positive terms, as contributing to the health of the consumers. Ironically, the 'natural' practices of plant husbandry in the vineyard are only made possible by the enrolment of a heavy metal – copper.⁸ By changing the terms of the conversation, by creating two, spatially-bounded ethical registers, and by holding the two spaces of ethical practice apart, Daniele contested the sources of SO₂'s ethical weight. By insisting on the separateness of the practices, he sought to protect himself from the ethical impact of the material. Creating two distinct ethical spaces allowed Daniele to keep apart what I, in the context of the interview, was inadvertently bringing together. The spatial differentiation served to pacify the ethical potential of the SO₂. The fact that the defence of the SO₂ use was a standard discursive weapon used by Daniele's marketing department indicates that Daniele was conscious of the vulnerability of his position, and that this was not the first time the spatialising manoeuvre had been performed.

⁸ Indeed a debate on the appropriateness of using a heavy metal in organic vineyards is taking place amongst the organic winemaking community, and it mirrors the terms and mechanisms of the SO₂ controversy, including practice distribution and silencing. This debate, however, has not reached the legislative and market heights of the SO₂ one, perhaps because the prospect of viticulture without chemicals is so threatening as a commercial risk to organic growers that the silencing is more successful, and more immediate, preventing the debate from 'going public'.

6.4.3.2 Ricardo: incommensurable practices

In this section I look at another situation in my research in which the incompatible practices of SO₂ use and distancing were brought together in the context of an interview. After the 2008 harvest, I visited a large, modern winery called Agriverde in Abruzzo. Agriverde specialised in heavy, oak-aged red wines which they exported all over the world. I was taking the tour of the winery with the company's owner, when we came across his oenologist, Ricardo, and I eagerly invited him to join us in the conversation. Ricardo was not employed exclusively by Agriverde, and so I was interested to find what he thought of the organic methods when compared to the conventional practices he witnesses and uses at other wineries. It is worth quoting at length from our conversation.

Ricardo: '(...) It's twenty years I've been doing this job. I work with a number of companies, this is the only organic one.

Anna: Are there differences visible?

Ricardo: Yes, I have to say that yes, the wines are much more mineral, because the soil remains alive, the flora of the soil, the earthworms, the insects, they keep the soil alive. (...)

Anna: How is it that the soil manages to survive in the wine?

Ricardo: Why? Is it strange? If the micro-organisms manage to survive in the soil, and the enzymes manage to transport between the soil and the root, it's clear the minerals of the soil come to the fore. If you use a traditional treatment which kills the soil microorganisms, the enzymes are not there, so what comes to the fore is all the product of fermentation, all the fruit. It seems a very logical argument. Organic means alive! (...)

Anna: What do you think of those who do natural fermentations [without the addition of manufactured yeast and without sulphites]?

Ricardo [with emphasis]: These are extreme behaviours. Sometimes they can't manage to control the product, so there are always surprises, in the end you may even find vinegar. [You have to] find the right processes, the right temperature, it is fundamental in order to have a guarantee of a wine's future. Choosing yeast for its own sake, or putting it into amphorae with the skins to ferment like that, sometimes you may find something interesting, sometimes vinegar. Who can afford to do that, 'One year out of ten I make a nice wine, the others not, perhaps I throw it away'. Why not control the temperatures if you can do it? Just to say 'I don't control them'? Because it's more romantic, more artisan? Perhaps it is more romantic, I do everything naturally, everything happens on its own... We work in the real world. We don't use anti-parasitic

treatments because we don't want to pollute the environment, we don't want to kill the soil, because the soil is full of microorganisms which bring the mineral from the root to the wine. Not because we are romantics, but because we believe in that process. To say: 'We don't do anything, the wine does it all by itself', it seems to me... A film.'

(14/11/08)

In our conversation, Ricardo worked to contain the ethical weight of SO₂ and other non-traditional winemaking practices. Firstly, in a move similar to Daniele's, Ricardo redistributed the spaces of natural and organic, drawing a boundary between the processes occurring in the vineyard and in the winery, and categorising only the former as falling into the category of 'nature', and therefore limiting the applicability of the organic no-chemicals principles to the vineyards. Secondly, when I asked Ricardo to express his opinion about 'naturalists', that is winemakers who shun the use of SO₂ in their wines, he created difference. He drew a very strong ethical distinction between his way of making wine – with the addition of sulphites – and the way of the 'romantics', who live in 'a film' and not 'in reality', ignoring the need to 'guarantee a wine's future'. He was representing himself as a rational market actor, who is concerned with the liquidity of the company's finances (who 'can't afford' to relinquish control) and who makes a sensible use of available technology.

As I discuss in the following chapter (Chapter Seven), and as we saw in the case of the EU organic legislation controversy, in the use of SO₂ the effect of bio-chemical stabilisation and the effect of facilitated marketisation are closely linked. As a result, the relationship a producer has with SO₂ will inform the size and type of the market they participate in. We could say that the two rationales of organic winemaking, and the linked ontological performances of organic wine which Ricardo evokes in the above quote (as a wine with and as a wine without SO₂) are best kept separate rather than be contrasted and compared, as they serve different purposes, they belong to two different market spaces and different market cultures (Abolafia 1996). Latour noted that when we are dealing with a controversy, that is a conflictual meeting of different practices, we should refrain from judging them on the basis of rationality, but instead re-distribute them to their relevant contexts.

'Nothing is by itself either logical or illogical. A path always goes somewhere. All we need to know is where it goes and what kind of traffic it has to carry. Who would be so foolish as to call freeways 'logical', roads 'illogical' and donkey tracks 'absurd'?' (Latour 1988, quoted in Mol 2002: 109).

The controversy here, then, could be resolved pragmatically: the indignation of Ricardo has a source in the evocation (by me) of an inappropriate market rationality – he 'can't afford' to work in this way. The practice of distancing oneself from SO₂ use, discursively and materially, is not supposed to be invoked in the context of his winemaking.

But Ricardo did not just write off my question as inappropriate and irrelevant. Instead, he sought to change the terms of the conversation by putting 'quality' before 'naturalness' as a more

desirable quality in wine, and by dismissing the source of the ethical presence, that is the SO₂-free organic market, as irrelevant, 'a film'. And this move betrays the relevance of the ethical concerns over the use of SO₂ to his situation, and even his market. In my view, Ricardo's frustration with the winemaking methods I evoked with my question, and his indignant response, were not only about drawing difference between 'appropriate' and 'inappropriate' winemaking practices in the context of his market. They were also a sign of a potential controversy, that is a clash between two practices of SO₂ – the distancing performed by the 'romantics' and the embracing performed by the 'realists' – which usually exist in different spaces and different discourses. The practices are usually distributed – held apart – and the clash was created when they were brought together in the context of the interview.

What we are dealing with here, I argue, is controversy (Mol 2002), irony (Haraway 1991), or interference (Law 2002b). 'In practice', Mol tells us, 'sometimes, there are gaps – gaps that may come with clashes (...) and if they do, (...) the incoherencies (...) give rise to controversies' (Mol 2002 : 87). Similarly, Law explains that practices are enacted, and in that enactment interfere with other alternative strategies and styles (Law 2002b). Here, the enactment of SO₂ as an ethical material, and the power of this enactment, makes itself felt once again. Ricardo was an oenologist, not a marketing specialist, and had no ready-made explanations for the presence of SO₂ in an organic winery. Instead, he attacked the very source of the controversy, seeking to silence it by discounting the practice of SO₂ distancing as illogical. However, by positioning their wines within the organic winemaking discourse, Agriverde can never hope to silence the latent ethical presence of SO₂ as a material loaded with significance. This ethical controversy cannot always be distributed away, but will always come to the fore in situations when the two performances of SO₂ are brought together within one conversation, as was the case in the interviews cited above.

Usually the different practices of SO₂ are distributed – it is silently accepted in the winery, while at the same time loudly condemned on the winery's web-page, for example. But the practices come to clash when they are brought together in particular places, such as when well-meaning researchers and legislators attempt to transform an industry, or when an inquisitive geographer brings the material, the cultural and the economic together in one uncomfortable question. The wriggling and the blaming and the ethical positioning which follows are attempts to pacify the controversy, but it is an attempt doomed to failure. SO₂ remains multiple.

6.5 Conclusion

The multiple performances of sulphur dioxide – as a bio-chemical stabilising agent, as a facilitator of marketisation, and as an ethically suspect 'chemical' – while sometimes incompatible are all necessary to the functioning of organic wine markets. In this sense the practices of SO₂ embody the key tension at the heart of the worlds of organic wine, a tension between the practices which aim at creating a world of pacified, qualculable goods, and the practices which aim to cultivate a space for unpredictable and creative nature. As long as the chemical remains black-boxed, functioning but not questioned, the mechanism of organic wine production can continue. Bringing its dubious ethical status to light, be it in the context of an interview, or, more dangerously, in the

context of European legislation, necessarily ends in conflict. While organic winemakers cannot live without sulphur dioxide, they also cannot live with it – at least, not in public.

In this chapter, I presented three ontologies of sulphur dioxide which are most crucial for organic winemaking as a practice, as a market and as a culture: SO₂ as an oenological practice, SO₂ as a facilitator of marketisation, and SO₂ as an ethical discourse. The domains of the three practices are not distinct, which highlights the limited analytical usefulness of stiff categories of ‘culture’, ‘market’ and ‘society’. In following SO₂ as practices, I draw out the SO₂-dependent networks elements (which could be categorised as economic, cultural and ethical). I show that these elements work together in multiple actor-networks of co-dependence. Importantly, the different practices are not commensurable. Depending on which position one occupies in the network, some practices of SO₂ are ‘weightier’ than others, more difficult to remove. Their strength derives from the number of links existing between these practices and other parts of the network which depend on them. To put it crudely, when it comes to sulphur dioxide in most cases pacification wins over making spaces for nature. In some cases, SO₂ is irreplaceable.

However, the world is not black and white. Using sulphur dioxide is just one practice amongst many which result in the creation of perfectly ‘pacified’ wines (if such do indeed exist), and for the winemakers in my research navigating the ‘grey area’ between market-friendly pacification and the ethical pull of ‘naturalness’ is the order of the day. In the next chapter, I peer into these murky waters as I consider the ways of making organic wines, even the most lively ones, marketable.

