

Introduction

DEFINING TERROIR

Walk into any wine bar today in Italy (or elsewhere, for that matter) and you will find the place so crammed with glass-swirling *terroiristes* it's almost immoral. It was not always so. Jean-Claude Berrouet, for over forty years technical director at J. P. Moueix (the producer of wines of near-mythical status such as Château Trotanoy, Château La Fleur-Pétrus, and, in California, Dominus, who is still today the consultant winemaker at Pétrus), is one of the wine people I respect and have learned the most from over the years. During one encounter with him in what others might have defined as my salad days of wine writing (I wrote about one such meeting in the “Ampelology” chapter of *Native Wine Grapes of Italy*, and not by chance, I do so again here), he was kind enough to discuss the subject of terroir at considerable length. As is often the case when I am around him, I had just finished saying something completely wrong; in such moments, Berrouet pauses, with the hint of a smile (probably trying hard to keep a straight face despite what he has

just heard), looks straight toward you like a laser beam directed onto a stick of butter (and *you* are the butter), and says something so clear you never end up forgetting it. In this case, it was: “You know, Ian, back when I was your age, to say that a wine had a *goût de terroir* was seriously offensive.”

The word “terroir” originally derives from the Latin word *territorium*, or “territory,” but over time it lost that association and took on the meaning of the French word *terre*, or “earth”; therefore, back in the 1930s or 1940s, to tell someone his wine tasted of the earth was just about the best way to ensure you wouldn't be invited back to the house (which, depending on how you felt about the person and his or her wines, might have been a good thing). Dating back to the seventeenth century, the word “terroir” was used to refer to the soil and subsoil only, and anything tasting of the earth was frowned upon as being something rustic, or worse, unclean (Matthews 2015). In modern times, “terroir” has taken on a broader meaning, one that encompasses the highly complex interaction of grape variety, soil, climate, and

human involvement in the production of distinctive wines from a specific site or area (Seguin 1986; Van Leeuwen and Seguin 2006). According to Michael Broadbent, who holds the title Master of Wine and is one of the world's foremost wine experts, wine is a product of man, but even more important are the earth—the soil and subsoil—and the climate, because there is little or no point in cultivating vines and making wine in a place not suited to *Vitis vinifera* (Broadbent 2003). It is only when grapevines have been planted in the right place that man's role becomes most important. Aubert de Villaine, the gentleman in charge at Domaine de la Romanée-Conti, in Burgundy, believes the same: there can be no great terroir without human beings allowing those very terroirs to express themselves to their fullest potential (de Villaine 2010).

The notion of terroir today includes all the features of a landscape and of the past and present societies that have, or have had, an effect on the wine you drink. Therefore, many different factors contribute to terroir in their own important way. Plant the same grape variety in two different areas, and they make remarkably different wines; plant them in the same area, and the wines can turn out noticeably different as well. All it takes is for one of the two plantings to be done in a shady area, and the other perhaps in an area exposed to the cold north. Clearly, a wine made from Nebbiolo tastes different from one made with Sangiovese, and more different still from one made with Cabernet Sauvignon. However, as many wine lovers know, plant Nebbiolo in Monforte d'Alba's Ginestra and Bussia crus (the real Bussia: an important matter I will broach later in this book; see the section titled "The Italian Job" in part 1 and the Nebbiolo entry in part 2), and the wines, though similar, will also differ. Clearly, terroir differences can change what a grape can give only to a degree. You cannot expect Sangiovese to give you the inky-black-hued wines of Merlot; no matter where you plant Sangiovese, that fact stays true. However, by planting it in appropriate soils and intervening with creative viticulture

and winemaking techniques (judicious water deprivation, very low yields, cold soaks, and small oak barrels), you can certainly kick Sangiovese's wine color up a notch or two. Just remember that no amount of terroir will ever turn a 100 percent Sangiovese wine into a Merlot or Montepulciano doppelgänger (please note that I use that word not with poetic license but rather in its literal but oft-forgotten meaning). This is because the genetics of each grape variety determines what each can and cannot give: terroir (which includes the actions of human beings) can only modulate the end result.

Using different words: if the grape variety is the vehicle, then terroir is the driver. One cannot function well (at all, really) without the other. It follows that it doesn't matter if Riesling is the world's greatest white grape or not: Riesling being a cool-climate variety, if you should decide to plant it in one of the coastline vineyards of Sardinia, you have no hope of making a great wine, never mind hearing the voice of the land. The message will be hopelessly muddled, if not downright absent. Because wine is the end product of grapes grown in specific places, the metabolic composition of the grapes used to make that wine depends both on the genetic makeup of the grape and on its interaction with the many factors that characterize a specific terroir. Varying concentrations of sugars, organic acids, esters, flavonoids, anthocyanidins, and many other compounds in the grapes all affect the way a wine will taste. Some of these compounds are found within the grape to begin with and have their concentrations modified during the ripening process. Without any creative winemaking action, a wine tastes of peach because the grape used to make that wine has aromatic precursor molecules that through the winemaking process will liberate, among other molecules, γ -undecalactone, which smells of peach. It follows that the genetic element (the grape variety) is all-important in determining the aromas and taste of any wine and is the single most important factor in determining the terroir

effect, while terroir's other factors help fashion wines distinctive of a finite area.

Taking Chianti Classico as an example, 100 percent Sangiovese wines made with grapes grown in Gaiole and Radda (two specific subzones of the denomination) are usually sleeker wines, and wines of greater total acidity, than those of Castelnuovo Berardenga (another Chianti Classico subzone). All three subzones are associated with magnificent but distinct wines: the differences are especially obvious when the wines from Gaiole and Radda are made with grapes grown in spots located at higher average elevations and with soils especially rich in calcium carbonate. In these areas, the interaction between strong ventilation rates and high calcareous soil content leads to slowed grape ripening and higher acidity levels in the grapes; in Castelnuovo Berardenga, where vineyards lie at lower elevations and calcium carbonate is not as abundant, such an effect is lacking. It is easy to understand why the wines from the latter subzone taste so different from those of the other two subzones.

But there's more to wine than just cultivar, geology, topography, and climate. Human beings, with their viticultural and winemaking decisions, also help fashion what a wine will be like. The winemaking process causes molecules to be newly formed, either by the transformation of preexisting precursor molecules in the grapes or by yeast activity in the must; for example, which yeasts one chooses to use will play a role in determining the expression of terroir in that wine. In fact, the degree to which the biochemical profile of a wine is changed depends not just on the yeasts performing normally, but also on the ambient conditions the yeasts find themselves in. (For example, in conditions of environmental stress, yeasts produce very different molecules than they would produce otherwise.) Viticultural practices are just as important: if a farmer chooses to let his vineyards produce twice as many grapes as those of another grower, it is likely his wine will taste more diluted. If in a hot climate one producer decides to remove all leaves from the vines

(thereby fully exposing the grapes to the sun's rays), that producer's wines will taste obviously different from one made with grapes kept under a cool, shady leaf canopy. Clearly, human decisions will also impact heavily on how a wine will taste. For example, in 2015, Anesi et al. found that viticultural practices (row direction and vine training system) and certain soil properties (pH and active lime) correlated with the composition of volatile metabolites in wines, which clearly leads to different-tasting wines. Terroir in a nutshell.

SCHRÖDINGER'S WINE

Looking for and finding terroir in wine is not the playground of a privileged few. At different levels, terroir in wine speaks to all wine lovers. I strongly believe terroir is more than a mere physical, viticultural, or winemaking concept leading to different biochemical outcomes. There are important cultural, intellectual, socioeconomic, ecological, and spiritual components to terroir. In this sense, my view is not different from the one voiced by Vaudour (2003), who wrote of terroir in terms of the socioeconomic, cultural, and ethnological meanings of a geographical place. For example, the intellectual aspect of terroir is huge: even after decades of drinking fine wines, many wine lovers remain mesmerized by the many nuances that great wines offer and the reasons such wines behave thus. Sardinia offers delicious Vermentino wines; but whereas a Vermentino di Sardegna is all about fruity charm, a Vermentino di Gallura (made with grapes grown on degraded granite soils highly characteristic of the Gallura region of Sardinia's northeastern corner) offers greater salinity and power. Why that is fascinates a subset of wine lovers on a wholly different level than just the hedonistic experience the individual wines provide. A well-made entry-level Alsace Riesling wine from just about any decent site is delightful, but one made with grapes from the Schlossberg grand cru is usually deeper and richer. However, because of differences in soil, exposure, and microclimate, Schlossberg Rieslings made from the summit,

the middle, and the bottom parts of the Schlossberg hill are very different wines. Part of the intellectual stimulation in wine resides in the discovery of (or rather, the attempt to discover) all the different facets that a specific terroir can showcase. For this subset of aficionados, wine is not just about making and drinking it, but also about *thinking* it: questioning and deconstructing wine are highly enjoyable steps of the same game.

Though this approach to wine might come across as a little excessive to those just starting out in wine or not prone to intellectual gamesmanship, it isn't, really. Think of this in the same terms you would pasta. Some people go to a restaurant and just ask for a plate of pasta, limiting themselves to choosing a sauce they like, be it *carbonara*, *amatriciana*, or *cacio e pepe*; but an Italian, or anyone seriously into food, will also look at the specific pasta shape paired with the sauce. Pasta shapes are myriad, including *spaghetti*, *tagliatelle*, *fettuccine*, *bavette*, *penne (rigate and non rigate)*, and others. The reason for so many different shapes is that each different sauce actually wants a different type of pasta, and vice versa: specific pasta shapes hold on to sauces in different ways, and in the end, the flavor and texture of what you are eating will be different than it would otherwise be. You didn't really think Italy has over one hundred codified and officially recognized pasta shapes just because someone had lots of imagination or free time on their hands, correct? Just imagine that pasta shape is a matter of such importance that back in the 1980s, the famous pasta company Barilla hired no less than Giorgetto Giugiaro and his Italdesign Giugiaro firm (Giugiaro is one of the world's foremost designers: he has created the Volkswagen Rabbit; the DeLorean DMC-12, made famous by the *Back to the Future* movie franchise; numerous Maseratis and Ferraris; Apple computer prototypes; Nikon camera bodies; and other iconic elements of twentieth-century style) to create a new pasta shape. Which he did, wind-tunnel-like drawings and all, creating "Marille"; that the curvy, inner-ridged cross

of *rigatoni* and *scialatelli* was less than successful than it should have been attests to the complexity involved in the apparently simple details, such as pasta shape, that create an ultimately satisfying taste experience. And so it is with wine grapes and terroir: details matter.

Terroir is also a cultural concept of significant socioeconomic impact, for, much as native grapes do, it speaks of specific places and people, their traditions and habits. In fact, both Aubert de Villaine and Jacky Rigaux (author, university professor, and one of the world's most knowledgeable people on all things Burgundy) go so far as to speak of a "civilization of terroir." After all, UNESCO created its World Heritage Sites with just this objective in mind: to preserve the cultural, historical, and natural landscapes. (Famous wine-production zones such as the Langhe and the Burgundy *climats* are World Heritage Sites.) The interplay between terroir and culture occurs everywhere. Basilicata's Aglianico del Vulture, one of Italy's potentially greatest red wines, is completely different from Taurasi, another red wine also made with Aglianico grapes grown on volcanic soil, but in Campania. Campania and Basilicata are two different places: the people are different, their histories are different, the land is different. The wines, too, are different, because each represents a specific way of life, a specific memory. It's a cultural thing. This is true even within a region itself. Aglianico del Vulture made at five hundred meters above sea level near Maschito on reddish-clay soils should and does in fact taste different from Aglianico del Vulture made from grapes grown at six hundred meters above sea level on lava-rich soils near Barile, for example. (See the Aglianico entry in part 2.) Those who farm Maschito vineyards expect their Aglianico wine to speak of who they are and where they are from: they want, even need, their Aglianico to showcase the differences with respect to any Aglianico wine made elsewhere. The common denominator is the grape variety—the first and most important step in any terroir-based wine; but much as Clint Eastwood's character in Sergio Leone's 1966 film *The Good, the Bad and the*

Ugly believes that every pistol has its own sound, Aglianico del Vulture from Maschito sings its own tune, too. And in so doing, it speaks of Maschito to the world. It follows that the socio-economic impact of that terroir-specific wine will be felt in the community (in terms not only of wine sales, but also of increased tourism to the area and increases in sales of other local food products and handicrafts to visitors).

The concept of terroir also has ecological importance. Terroir-oriented viticulture is ecologically friendly: for example, the cultivation of vines high on the alpine slopes of Valle d'Aosta and Valtellina reduces the risk of erosion and helps to preserve them, reducing the risk of landslides. And the centuries-long cultivation of a specific grape variety adapted to a specific spot makes for a more eco-friendly agriculture than one where producers rip everything up just so they can plant the latest grape flavor of

the month. Last but not least, terroir is a spiritual concept. Great site-specific wines speak of much more than just soil, climate, or viticultural practices. Potentially, they have an inspirational quality (from the Latin *inspirare*, “to breathe into”), breathing new life and new experiences into people and propelling them into, however briefly, a higher realm. It’s a unique experience. Much as Schrödinger’s cat confuted quantum superposition theory (a quantum system exists as a combination of dynamic states that can have different outcomes; hence a cat that may be simultaneously both dead and alive, which is unlikely), terroir-specific wines are, if you will, Schrödinger’s wines. Their ability to live simultaneously in different states (the physical, the intellectual, the spiritual) is a random event that may or may not occur, and often doesn’t. We are all the better for it when it does.

