

CHAPTER 1

European Wine on the Eve of the Railways

Wine-making is an art which is subject to important modifications each year.

—Nicolás de Bustamente, 1890:103

WINE WAS AN INTEGRAL PART of the population's diet in much of southern Europe. In France on the eve of the railways, there were reportedly over one and a half million growers in a population of thirty-five million. High transport costs, taxation, and poor quality all reduced market size, and most wines were consumed close to the place of production. Volatile markets also forced most growers to combine viticulture with other economic activities. Alongside the production of cheap table wines, a small but highly dynamic sector existed that specialized in fine wines to be sold as luxury items in foreign markets. In particular, from the late seventeenth century foreign merchants and local growers combined to create a wide range of new drinks, primarily for the British market, and in the 1850s wine still accounted for about half of all Portugal's exports, a quarter of Spain's, and one-fifteenth of France's.¹

The process of creating wine followed a well-determined sequence: grapes were produced in the vineyard; crushed, fermented, and sometimes matured in the winery; and blended (and perhaps matured further) in the merchant's cellar; finally, the wine was drunk in a public place or at home. This chapter looks at the major decisions that economic agents faced when carrying out these activities. It examines the nature of wine and the economics of grape and wine production, market organization, and the development of fine wines for export before 1840.

WHAT IS WINE?

The *Oxford Companion to Wine* defines wine as an alcoholic beverage obtained from the fermentation of the juice of freshly gathered grapes.² Grapes are cut from the vine and crushed to release their sugars, which are then fermented into alcohol by the natural yeasts found on the grape's skin. In expert hands and in

¹ Port wine and madeira represented 38 percent and 7 percent, respectively, of all of Portugal's exports in the 1850s, while sherry accounted for 20 percent of Spain's exports between 1850 and 1854 (Prados de la Escosura 1982:41; Lains 1992:126; France. Direction Générale des douanes).

²Robinson (2006:768).

favorable years, this simple process might produce an excellent wine, but until recently, quality in most years was often poor. Much of the wine produced was drunk with water, especially as this reduced the risks posed by water-borne diseases, which helps to explain the seemingly high levels of drinking in producer countries.³ In some regions resin, honey, or herbs were added to hide the deficiencies in wine making. There was also a long history of the use of more dangerous substances, such as lead and lead compounds, to balance the wines and give them a slightly sweet taste, but by the second half of the eighteenth century these additives had been correctly identified as the cause of severe abdominal pains (the colic of Poitou) and banned.⁴ Adulteration was carried out by any of several economic agents along the commodity chain wishing to gain financially from the illegal activity. For example, growers in the Douro on occasion used the skins of dried elderberries to give more color to port wine; the Midi wine producers added sugar and water to make “second” and “third” wines; Spanish wine merchants used industrial alcohol produced from potatoes to fortify their wines before exporting; and Paris retailers added water to increase volume.

A combination of urbanization, which implied that consumers no longer knew the origins of the wine that they drank; scientific progress, which had the negative externality of making it easier for would-be fraudsters; and greater consumer awareness brought about by the rapidly expanding local press led to the adulteration of food and beverages being a major issue in all countries by 1900. Therefore, although romantic poets appear never to have drunk a poor wine, one popular French saying of this time suggested that it took three to drink a bottle: one to hold the person, a second to pour it down his throat, and finally the victim himself. An Argentine joke had a wine merchant on his deathbed confessing to his son that wine could be produced “even” from grapes. National laws, such as France’s Griffe Law of 1889, might classify wine as being made from fresh grape juice, but additional legislation was used to control additives considered legitimate for the wine-making process, such as those required to increase sugar or acidic content, antiseptics such as sulfur dioxide, fining agents, or yeast cultures. Exactly what was permissible and what not varied both over time and between countries, and inevitably what was considered as adulteration depended on who did it and whether this information was made available to the consumer prior to purchase.

Wines are highly diverse and can be classified by their color (red, white, rosé); by alcohol content (table wines usually range from 9 to 15 percent alcohol); by sweetness; by age (young or old); as still or sparkling; or by whether alcohol has been added during the wine making (dessert wine such as port or sherry). For perhaps 95 percent of wine this type of classification is sufficient, but for fine

³ People in northern Europe drank tea much earlier and in much greater quantities than did those in the wine-producing areas farther south.

⁴ Gough (1998:82).

wines the list is far too simple. The characteristics of a wine produced from a single grape variety such as cabernet sauvignon differ significantly according to the soil's physical and chemical characteristics, hydrology, topography, micro climate, and so on. Wine produced on one part of a vineyard might sell for many times that of wine from another part, even though grape varieties, cultivation techniques, and wine-making technologies are broadly similar. The price of a fine Bordeaux claret, such as Château Latour or Château Margaux, depends on a number of characteristics, some of which are exceedingly difficult to classify, such as color, body, tannin content, bouquet, and freshness. Equally important, and especially in northern Europe, quality varies significantly with each harvest because of weather conditions and vine diseases: the price of Château Latour fluctuated from a minimum of 550 francs a tun to a maximum of 6,250 francs, with a standard deviation of 2,088 in the 1860s.⁵ Consequently connoisseurs of fine wine look at two variables in particular as indicators of quality: the growth (a vineyard's geographical location) and vintage. Today's technology and producers' skills have greatly reduced the influence of weather, although perfect conditions remain a rarity, as suggested by Bordeaux's 2005 vintage, which was described as "the deckchair vintage" because it was sufficiently easy that owners could afford to "spend the summer sunning themselves."⁶

Fine wines sold for high prices, and were frequently exported (and thereby provided a country with an important source of foreign exchange), but they were insignificant in terms of volume compared with total production. Chaptal estimated in 1811 that approximately three quarters of all French wines sold for less than 20 francs a hectoliter, or less than a tenth of what the leading 2 percent of wines fetched, although the latter accounted for over 20 percent of the total value of wine production (table 1.1). In Spain ordinary table wines still accounted for almost 90 percent of volume in the 1930s.⁷

A major distinction in this book is therefore between fine and commodity wine production, as they were two discrete industries in the period under discussion, each following quite different objectives. Quality was crucial for fine wines, and growers enjoyed significantly higher incomes when this variable was achieved than when harvests were large. By contrast for commodity producers quality was limited to their ability to produce a sound wine that could be sold to merchants for blending.⁸ Both groups were market oriented, but for commodity producers there was no attempt to improve vineyard management practice to produce a better wine, as this would reduce yields and consequently profits. Be-

⁵ Pijassou (1980).

⁶ Robinson (2009). In 2008, by contrast, "they had to spend most of the time in the vineyard fighting rampant mildew and fending off rot."

⁷ Ministerio de Agricultura (1933:128–29).

⁸ Figures for the Côte d'Or in Burgundy between 1820 and 1879 show that fine-wine producers maximized their incomes when quality was high and harvests were small, but the reverse was true for commodity wine producers (Loubère 1978:125–26).

TABLE 1.1
Output and Value of French wine, 1804–8

<i>Frans per hectoliter</i>	<i>Quantity produced (millions of hectoliters)</i>	<i>Value (millions of frans)</i>	<i>Output (as % of total)</i>	<i>Value (as % of total)</i>
7.5	5.4*	40.2	15.3	5.6
7.5	10.5	78.8	29.8	11.0
10.0	4.6	46.0	13.1	6.4
15.0	3.4	51.0	9.6	7.1
20.0	2.3	46.0	6.5	6.4
25.0	2.0	50.0	5.7	7.0
30.0	1.7	51.0	4.8	7.1
35.0	1.6	56.0	4.5	7.8
40.0	1.5	60.0	4.3	8.3
50.0	1.6	80.0	4.5	11.1
200.0	0.6	160.0	1.7	22.2
	35.2	718.9		

Source: Chaptal (1819, 1:175–77).

*Wine destined to be distilled

tween these two major extremes there was a small group of favorably located growers in places such as Bordeaux or Champagne who chose vineyard management techniques to limit production and improve quality, and who therefore needed to sell their wines at better prices than commodity producers to cover their higher production costs. These premium producers were the ones that demanded appellations at the turn of the twentieth century.

An important characteristic of Europe's commodity wine production was that it was produced by hundreds of thousands of growers in very small quantities and then blended by merchants to meet consumer demand. The advantages of blending were considerable, as André Simon, a leading authority, noted in 1920:

The blending of wine is both legitimate and necessary. It is a perfectly legitimate manner of improving different wines, of improving them without tampering with any fundamental law of Nature. It is sometimes necessary, in order to render more readily saleable wines which, in spite of being sound, might be otherwise difficult to sell. Blending is resorted to by honest people, who deal in none but honest wines, as and when it is their best chance of supplying better value. Blending is the only sound method of improving the quality and of lowering the cost price of most wines.

The general object of blending may be said to consist in giving better value to the consumer and greater profits to the trader; the means to that end being the standardization of quality and prices.⁹

⁹Simon (1920:77).

Simon uses words such as “legitimate” and “honest” because blending clearly provided plenty of opportunities for fraud and adulteration. Fraud involved selling wine under the label of a private brand such as Moët & Chandon, or collective regional brands (Bordeaux or Champagne) when it had been produced elsewhere. Adulteration, by contrast, consisted of adding ingredients that were considered illegal or “unnatural” to wine and the wine-making process.

As late as the First World War, Europe still produced and consumed approximately 90 percent of the world’s wine, with France and Italy alone accounting for three-fifths (table 1.2). Algeria, Argentina, Chile, and the United States, by contrast, produced little more than 10 percent, although production in these countries was growing rapidly. Production in Algeria, which was an administrative district of France at the time and consequently enjoyed free access to this market, reached a million hectoliters for the first time in 1885, a figure that the United States achieved in 1887, Argentina in 1900, and Chile in 1901.

FAMILY PRODUCERS

The virtues of the vine for traditional small-scale family farms are best summarized by Arthur Young, a British observer who was otherwise generally highly critical of French farming. Young noted in his travels through France in the late 1780s that the cultivation depended “almost entirely on manual labor . . . demanding no other capital than the possession of the land and a pair of arms; no carts, no ploughs, no cattle.”¹⁰ The vine required no fallow and little if any manure, and it adapted to all kinds of soils, including those “which produce nothing but useless thorns and briars.”¹¹ Because the vine was much more productive than most other crops, a couple of hectares in ideal conditions could maintain a family.¹² Yet few relied exclusively on it because vineyards in one year “yield nothing; in another, perhaps, casks are wanted to contain the exuberant produce of the vintage: now the price is extravagantly high; and again so low, as to menace with poverty all who are concerned in it.”¹³ In France harvest size had a coefficient of variation more than four times greater than other crops.¹⁴

According to Young’s calculations, vines in France yielded an annual average of £9 per acre, compared to the £6 or £7 for the best land in England, which also

¹⁰ Young (1794, 2:25). The version used here is the second chapter, on vines, of the Bury St. Edmonds edition.

¹¹ Gasparin (1848:595).

¹² Lachiver (1988:245). Augé-Laribé (see below) suggests 5 hectares as a minimum for full-time growers in southern France.

¹³ Young (1794, 2:203). Labrousse (1933, 1:269–76) noted that in eighteenth-century France, “the cyclical fluctuations [of wine prices] are . . . superior to those of all other products.” Cited in Brennan (1988:97).

¹⁴ Toutain (1961:154), cited in Loubère (1978:121).

TABLE 1.2
Leading Wine-Producing Countries before 1914

	<i>Wine production (millions of hectoliters)</i>			<i>% of total in 1909–13</i>
	<i>1865–74</i>	<i>1885–94</i>	<i>1909–13</i>	
France	55.4	31.9	46.4	31.4
Italy	23.6	31.9	46.0	31.2
Spain	17.1	21.9	14.9	10.1
Austria-Hungary	3.2	7.7	7.9	5.4
Portugal	2.1	4.3	4.8	3.3
Greece	0.2	1.8	3.2	2.2
Germany	2.5	2.5	1.8	1.2
Russia	3.3	3.5	1.4*	0.9*
Rumania	0.1	2.8	1.4	0.9
Bulgaria			0.8	0.5
Other European			0.9	0.6
European total			129.5	87.8
Algeria	0.2	3.1	7.9	5.4
Argentina	n.a.	n.a.	4.4	3.0
Chile	n.a.	n.a.	2.0	1.4
United States	0.3	1.0	1.9	1.3
Russia (Asia)			0.9	0.6
South Africa	0.7	0.3	0.3	0.2
Tunisia			0.3	0.2
Australia	n.a.	0.1	0.2	0.1
Other countries	5.1	15.7	0.2	0.1
Non-European producers			18.1	12.3
World	113.7	125.7	147.6	100.0

Sources: 1865–74 and 1885–94: Morilla Critz (1995:303); 1909–13: International Institute of Agriculture (1915b:110–11, and Mitchell (1995:240). For Portugal, Lains and Sousa (1998:965). For Argentina, table 11.2. For Australia, fig. 10.1. For the United States, Shear and Pearce (1934, table 10).

*Refers to European Russia.

required an expensive fallow.¹⁵ As a result Young claimed the vine produced “more than sugar pays in the West Indies, which is usually supposed the most profitable cultivation in the World.”¹⁶ His estimates of an annual net return of 7–10 percent would be much higher if the wine was stored six months after the vintage. High returns, however, were achieved with high production costs. On France’s vineyards on the eve of the revolution, average annual cultivation costs

¹⁵ Young (1794, 2:21).

¹⁶ *Ibid.*, 22.

were between £4 10s. and £5 17s. an acre, of which £2 12s. 6d. was for labor, a figure “about thrice as high as that of common arable crops.”¹⁷ Indirectly, however, labor costs were even higher, as most of the capital costs were associated with planting the vineyard, another labor-intensive activity.

Land inequality was common in many parts of Europe, resulting in a few individuals owning significantly more land than they could farm themselves with their own labor, and much larger numbers having to find additional employment. For the large landowners, some types of agriculture lent themselves much better than others to either direct farming using wage labor or some form of rental agreement. In general, and apart from exceptional circumstances such as when farm prices were very high, the use of cash rental contracts or wage labor was unsuitable with most tree or bush crops such as the vine. The explanation is not difficult to find because vines can be easily and permanently damaged if the pruning, plowing, and hoeing operations are badly carried out. According to the Spanish agronomist Esteban Boutelou in 1807, “no crop suffers more from the omission or poor quality of work, requiring many years to recover from the abuses of a single year.”¹⁸

The problem was therefore one of moral hazard, namely, wage laborers or tenants treating the vines with less care and attention than their owners required. On some occasions landowners did succeed in developing an incentive structure that aligned the laborers’ interests with their own. Fine wine producers in Bordeaux developed a contract that provided good working conditions and pay, precisely because they wanted workers to return each year and acquire specialized, site-specific knowledge of a particular plot of vines (chapter 8).

Yet Bordeaux is the exception that fits the rule. Most landowners could not use wage labor because the poor-quality wine they produced made it unprofitable to pay a sufficiently high wage to ensure good-quality work. With the exception of the harvest, most vineyards were therefore worked by their owners, although by the late nineteenth century some landowners found ways to create large wine estates in parts of the Midi and Algeria, for reasons that will be explained in chapter 2.

Tenancy arrangements were also rare in viticulture as landowners found it extremely difficult to determine whether a poor harvest was the result of climatic factors or the agent’s idleness, a problem made more difficult by the inverse relationship between harvest size and quality.¹⁹ A short-term rental agreement gave incentives for tenants to prune the vines to maximize harvests, but this short-

¹⁷ *Ibid.*, 20, assumes a production £9 per acre and a net profit of £3 3s.–£4 10s.

¹⁸ Boutelou (1807:66). Monitoring wage labor was especially costly on old vineyards that had developed in haphazard fashion over the years. For a general discussion of viticulture and labor monitoring, see Galassi (1992:78–83), Hoffman (1984), and Carmona and Simpson (forthcoming).

¹⁹ Bardhan (1984:161); Galassi (1992:82); and Hayami and Otsuka (1993:3).

ened their productive life. Even with long-term contracts, the landlord ran the risk of receiving back a dying vineyard once the tenant's lease expired.²⁰ One alternative was a sharecropping contract, where the landowner provided the land and the tenant the labor, and the harvest was divided in a predetermined way, often fifty-fifty between the two parties. In this case incentives often coincided, especially if the contract was considered indefinite, as both landowner and sharecropper benefited from exceptional harvests or jointly suffered the losses from a poor one.²¹ However, sharecropping was rare outside a few specific areas, such as Burgundy, Beaujolais, Tuscany, or Catalonia. There were several problems of using sharecropping, especially the practical difficulties of dividing the harvest. In the regions noted above, wine quality was often better than average, the grapes were usually brought to the central farm, and the landowners themselves were heavily involved in wine making and marketing. Most landowners did not want to get involved in production, especially if only average quality wines were produced.²² Another problem was that because contracts divided output according to the relative value of land and labor inputs at the time that they were originally agreed, major conflicts occurred from the very late nineteenth century in places such as Tuscany and Catalonia when wine and land prices declined and wages rose.²³

Most vineyards were therefore small and worked by the owner's family. France in 1907 had 1,662,000 hectares of vines and 1,612,000 growers, or an average of about one grower per hectare, although these figures are distorted by the very large number of miniscule plots owned by part-time producers who only made wine for home consumption. The 1892 census for land use is inaccurate, but the more reliable one of 1924 shows almost 70 percent of French vines being on holdings of less than 5 hectares, with only 20 percent found on those farms with more than 20 hectares. France's southern Midi region had a number of large estates; if these four *départements* are excluded, 91.5 percent of all vines were on holdings of less than 10 hectares, and 83 percent on less than 5.²⁴ By contrast, 40 percent of the Midi's vines were on vineyards of 10 hectares or more. According to Augé-Laribé, writing in 1907, vineyard owners

²⁰ Evidence suggests that in Catalonia it took about five years to exhaust the vines. Carmona and Simpson (1999:292).

²¹ Some contracts, such as the *Rabassa Morta* in Catalonia, were explicitly long term or indefinite, while others, such as the *Mezzadria* in Tuscany, were renewed annually, although in reality the farm frequently passed from one generation to the next. To ensure that sharecroppers supplied sufficient labor, they were expected to be married, and all the family's labor was to be dedicated exclusively to the landowner's land.

²² Sharecropping was also used with multicropping. These issues are discussed in Carmona and Simpson (forthcoming).

²³ The appearance of new off-farm inputs such as fungicides and taxes had to be allocated between the two parties and could, at least in theory, compensate for these adverse shifts in the relative price of land and labor (Carmona and Simpson 1999:301).

²⁴ See appendix 1.

in the Midi with less than 5 hectares usually worked their vines with hand hoes rather than plows. On larger properties, the vines were likely to be plowed, and those over 25 or 30 hectares needed hired labor and perhaps a manager. Vineyards of 80 hectares or more took on the characteristics of an industrial enterprise.²⁵

The higher labor inputs compared with most other crops, especially cereals, implied that population densities were greater in areas of viticulture, and the villages larger. The more equitable property distribution led the historian Ernest Labrousse to claim that there were fewer conflicts than with other farming and livestock regions, while Marcel Lachiver notes that “one finds more homogeneity in the wine-growing regions, less submission, more democratic spirit, more fraternity.”²⁶ However, if this was indeed true for earlier historical periods, the half century prior to the First World War saw plenty of conflicts between local growers and outside interests.

THE PRODUCTION OF GRAPES PRIOR TO PHYLLOXERA

Contemporary descriptions of grape growing were similar for much of the world. What distinguished production, for example, on a major Bordeaux château from that on a small patch of vines on the edge of some poor isolated village was not the sequence of activities, but rather the level of care and their timing. Production costs in Bordeaux were very high because yields were low and labor inputs considerably greater than elsewhere. Yet everywhere viticulture was considered a business in the sense that growers were fully aware that the care and time spent on their vines would affect the size and quality of the future harvest, and therefore the level of attention depended on both the outlook for future wine prices and the opportunity cost of the grower’s labor. High wine prices (or the lack of alternative and more remunerative employment) increased the care that growers gave to their vines.

Traditional viticulture consisted essentially of land and labor and required little capital expenditure. Before the appearance of powdery mildew in the 1850s, a family needed only a few farm tools and the means to transport grapes to be crushed and turned into wine. Contemporary estimates for cultivation costs, such as those shown in table 1.3, therefore consist essentially of labor.

Considerable amounts of labor also were required to establish a vineyard. Du Breuil suggested in his *Vineyard Culture* that vines be planted at a depth of 0.30 meter in northern Europe and twice that in the South because “a dry and warm soil must be dug deeper than a rich, substantial, and somewhat cold soil, because

²⁵ Augé-Laribé (1907:134–37).

²⁶ See Labrousse (1944:596) for the late eighteenth century and Lachiver (1988:246), cited in Brennan (1997:10).

TABLE 1.3
Production Costs in Aude (the Midi), 1829 (francs per hectare)

	<i>By spade</i>	<i>By plough</i>
Depreciation of cost of vineyard (5%)	23	23
Replacement of vines	6	12
Pruning	12	12
First digging—24 days' work @ 1 franc + wine	36	—
Second digging—15 days' work @ 1 franc + wine	18	—
First plowing—7 days' work @ 4 francs	—	28
Second plowing—6 days' work @ 4 francs	—	24
First hoeing of vines—20 days' work (female) @ 0.50 franc	—	10
Second hoeing of vines—16 days' work (female)	—	8
Harvesting, transport, and treading of grapes	22.5	17
Transferring wine from the vat and pressing the marc	2.5	2
Upkeep of equipment	2	2
Land tax	12	12
Total cost in francs	134	150

Source: Archives Départementales de l'Aude, 13 M 61, cited in Valentin (1977, 2:108). My estimate for depreciation.

the root must penetrate deeper in the first than in the last.²⁷ To achieve a depth of 0.45 meter, Du Breuil recommended working the soil first with an ordinary plow to 0.15 meter, and then a further 0.30 meter using a strong plow pulled by six horses or oxen along the same furrow.²⁸ When the land was inaccessible, or the farmer lacked a plow team, the preparatory work had to be done by hand and labor inputs were much greater, especially if the land had to be cleared or terracing constructed. Augé-Laribé estimated 210 days labor needed to uproot a hectare of dead vines and then dig it to the depth of half a meter, while a study for Valencia gives 340 days to achieve a depth of 0.4 meter and a further 18 days to dig holes and plant the vines.²⁹ As much of this labor could be supplied during periods of high seasonal unemployment, its opportunity cost was low for family growers. In reality, however, the amount of time used to prepare the land often had less to do with the advice found in technical books than with the price of wine and the immediate profitability of viticulture.³⁰

²⁷ Du Breuil (1867:29). The first edition was published in French in 1863.

²⁸ *Ibid.*, 30.

²⁹ Augé-Laribé (1907:139) and Dirección General de Agricultura Industria y Comercio (1891:xv–xvi).

³⁰ Thus in Valencia (Spain) during the prosperous years between 1880 and 1885, the

cultivation of the vine advanced in intensity year by year, the plantation being made with great care after deep plowings, the digging of spacious holes for the plants, and abundant manuring. Today [1889], circumstances have unfortunately changed . . . , and those cares and plowings,

There are many different grape varieties, so growers had to search for those most suited to their vineyard. Many small growers planted a selection to reduce the risk that their whole harvest would be lost, as varieties differed in their susceptibility to extreme weather conditions or the presence of disease and pests.³¹ In addition, as the grapes often ripened at different moments, diversity allowed the harvest to be spread over a longer period and thus reduced the demand for outside labor. A well-balanced wine was far more likely to be produced in Europe from a “harmonious blend” of different grapes than from those of one kind of vine, “however fine some of its qualities may be.” This, according to Maurice Tait, was because “one wine may give ‘musts’ with an excess of acidity, another with superlative colour, a third a specially delicate ‘nose,’ a fourth may be good in dry years, and a fifth may be better in rather cool shady situations.”³² This was just as true for the classic Bordeaux clarets, where growers looked for a desired balance between cabernet sauvignon, merlot, and cabernet franc, as it was for the cheapest beverage wine.

Vines were sometimes propagated by cuttings, which in France was considered the “simplest,” gave the best results, and was “the one most in vogue.”³³ The number of specialist nurseries increased with the appearance of new vine diseases but the large number of plants required in some regions and the long time before a reasonable harvest was produced were considered disadvantages. Instead, many growers resorted to layering (*provignage*), which involved taking a long cane from a mature plant and burying it under the soil to where a new vine was required. The following year the vine was detached from the mother plant. If grapes were not produced in the first year, they appeared in the second.³⁴ In many regions layering was the chosen method to replace dead or diseased vines, allowing vineyards to be kept in production indefinitely. When vine density was to be high in a new vineyard in a region such as Champagne or Burgundy, perhaps a third or half of the total number of vines were planted with cuttings or roots, and then each of these was used to produce one or two additional vines by layering.³⁵ Grafting was also carried out in some regions, such as in Hérault (the Midi), Champagne, or the Loire, especially to reduce the time required for certain varieties to produce their first crop, but in Spain it was rare outside of Barcelona prior to phylloxera.³⁶

while still taking place with some regularity, do not reach such a degree of perfection on account of the lack of resources (Spain, Dirección General de Agricultura Industria y Comercio 1891:xv)

³¹ Bustamente (1890:28) suggests a maximum of five or six varieties, as weather conditions that were unfavorable for one were favorable for others.

³² Tait (1936:17–18).

³³ Du Breuil (1867:67–68).

³⁴ *Ibid.*, 248.

³⁵ *Ibid.*, 113.

³⁶ *Ibid.*, 85. Grafting was rare in the Gironde prior to phylloxera (Cocks and Féret 1883:38). In 1877 for Barcelona it was noted that “the grafting of vines is widespread in this province; whether this is because of climatic reasons, the intelligence of the farmer, or for other unknown reasons, the

The number of vines planted per hectare varied significantly, from as many as 60,000 per hectare in the Champagne region to 4,000 in Hérault, falling to 2,000 in Spain's arid La Mancha.³⁷ The vine density therefore had a tendency to be greater in areas with higher rainfall, and where land was at a premium. It made layering easier and reduced the need for weed control, but it was highly labor intensive.

Pruning was the single most important activity in the vineyard and, if badly carried out, could both ruin the following year's harvest and permanently damage the vine. As one French proverb notes, "anyone can dig me, but only my master can prune me."³⁸ If too many fruitful buds were left on the vine, the fruit matured slowly and quality was impaired. If too few were left, the quality was generally good but the yield small. As Amerine and Singleton write, "Much skill and considerable luck are required to prune every year to obtain the maximum yield consistent with optimum quality, since grape variety, vine health, the weather, berries set per cluster, and the wine to be made all contribute in determining the optimum crop in any one season for a certain vineyard." Not unnaturally, these authors continue that "economics and human nature conspire to produce more errors on the 'too many' side."³⁹ Indeed, most of Europe's growers were advised in the mid-nineteenth century to "sacrifice quality for quantity," as the "price will never be sufficiently high to compensate for the diminished yield."⁴⁰

In the low-density, dry vineyards of southern Europe the goblet method of pruning was preferred. Here the vines were left freestanding at about 0.40 to 0.50 meter above the ground, and the grapes grew without supports. This saved the expense of staking, and plowing was less necessary because the ground was covered with the branches, choking the weeds.⁴¹ Elsewhere other methods of pruning were used, and stakes to support the grapes were required in sixty of the seventy-six districts where vines were cultivated in France.⁴² At the extreme, in the Champagne region, some sixty thousand wooden stakes were driven into the ground each spring and the vines attached to them, only to be removed again after each harvest so that the wood would not rot during the winter.

In the Médoc the vines were trellised on long laths, which accounted for a

graft, which is not only difficult but almost completely unknown in Castile, is done here with amazing ease and the vine grower changes the type of vine when it pleases him." In particular this was the case with the malvasia because, unless grafted with a fast-growing rootstock, it took ten to twelve years to produce fruit (*Exposición Vinícola Nacional 1878–79*:293).

³⁷ Du Breuil (1867:96); Spain, Dirección General de Agricultura Industria y Comercio (1891).

³⁸ Cited in Brennan (1997:17).

³⁹ Amerine and Singleton (1977:42).

⁴⁰ Du Breuil (1867:56, 58).

⁴¹ *Ibid.*, 129.

⁴² *Ibid.*, 156.

fifth of annual cultivation costs in the early 1880s.⁴³ The advantage of trellises is that vines could be grown in straight lines, making it much easier to cultivate between them. A further development, namely, the training of the vines along wires attached to large posts every four or five meters, significantly reduced the number of stakes and labor requirements. Du Breuil describes one system used by Michaux as early as 1845, but it was only with the development of an efficient method for tightening the wire to allow the trellises to remain in position permanently with the vines attached that this method gained in popularity. The savings associated with training vines along wires rather than the annual staking was 88 percent in Champagne and 50 percent in Bordeaux.⁴⁴ However, the diffusion of wire trellises on old vineyards was slow, as vines were rarely found in neat, long rows, and many owners adopted the system only when they were forced to replant after phylloxera.

Horse plows could be used when sufficient space existed between the vines, allowing growers to cultivate a larger area. A minimum of two plowings were considered necessary: in February or March after the pruning and fastening of shoots to their supports, and again at the end of the spring.⁴⁵ A plow worked by a single animal needed at least a meter of space to work between the rows, so they were common on almost all the vineyards in southern France but were much rarer farther north, where the vines were more densely planted. Hoes were used where the rows were too narrow or the vines no longer grew in straight lines because of layering. When wine prices weakened everywhere in Europe from the late 1880s, wages continued to increase, and reducing tillage costs became critical for some regions to remain competitive. In the Priorat region in Catalonia, for example, the steepness of the terrain made it difficult to use the plow, and the attraction of high-wage employment in the growing urban market of nearby Barcelona led to a rapid decline in viticulture after 1900.⁴⁶

The harvest was the one time of year when even family farms might employ wage labor, and the risk of disease or inclement weather made growers begin as soon as possible. Traditionally municipal ordinances fixed the start of the harvest, which helped reduce theft, but even after the ordinances were abolished, the fact that many proprietors made the wine from a dozen or so different grape varieties mingled together implied that some were inevitably unripe and “too often” imparted tartness.⁴⁷

The significant annual fluctuations in yields encouraged growers to diversify, and in some areas this took the form of cultivating other crops among their

⁴³ *Ibid.*, 166; Cocks and Féret (1883:52). Refers to ordinary wines (Palus region).

⁴⁴ Du Breuil (1867:170, 174–76).

⁴⁵ Producers of fine wines in Bordeaux carried out four in the 1860s (Cocks and Féret 1868:45).

⁴⁶ Perpinyà i Grau (1932:10–11).

⁴⁷ Redding (1851:41). In some areas, such as the Côte-d’Or, the ordinances continued during much of the nineteenth century. Lachiver (1988:209–14). For Spain, Pan-Montojo (1994:33).

vines. This was especially common in Italy, where in 1913 some 76 percent of the vines in the north of the country were intercropped (*coltura promiscua*), 85 percent of those in the center, and only in the drier south and the islands did it fall to 12 percent.⁴⁸ In France, intercropping (*culture à la Provençal*) was common south of the Loire, at least prior to phylloxera.⁴⁹ Where summer droughts restricted intercropping, growers often used only part of their land for vines. An alternative to crop diversification was for growers to work part-time as wage laborers. The large estates in both Bordeaux and the Midi, for example, required significant quantities of skilled labor for specific tasks such as pruning, while elsewhere some family labor was employed as domestic servants or in industry. In addition, small growers who owned a work animal or two could hire them out, and in the Midi as late as the 1950s this helped growers keep vineyards of less than 7 hectares viable.⁵⁰ Vineyard ownership helped smooth incomes, and Gérald Béaur has shown how laborers in the cereal land around Chartres in the eighteenth century bought small plots of vines when economic conditions were favorable and sold them again when they were adverse.⁵¹ It could also help social mobility, and in central France it was noted in the late 1870s that land “is still rather cheap, and there is a very large profit derived from putting it under vines; it is a speculation which is undertaken upon a large scale, to buy land, to plant the vine, and to sell the vineyard when the vine begins to produce, which means in about three or four years.”⁵²

Growers therefore adapted to short-term price movements by varying the quantity and quality of labor inputs, which affected wine output. In the medium term supply was less flexible. While growers were quick to plant more vines at times of shortage, market conditions had often changed by the time these became productive four years later. Growers were then very reluctant to uproot healthy vines because of the large amounts of labor invested in establishing a vineyard, equivalent to about four times the annual demand in cultivation. In addition, the land was usually poor, and the area too small, to cultivate most other crops efficiently. This created a ratchet effect, with growers being quicker to increase supply in response to higher prices than to reduce it at times of falling prices. For much of the nineteenth century this produced only limited problems, as the poor wine-making technologies ensured that periods of overproduc-

⁴⁸ Table 2.7.

⁴⁹ Loubère (1978:9–10). For Bordeaux, see chapter 8. The system was often criticized because the vines had to compete for the nutrients from the soil, and tillage on occasions was delayed because of the other crops (Du Breuil 1867:93–94).

⁵⁰ *Études et Conjoncture* (1953:530).

⁵¹ (Béaur 1998). In Zaragoza, Spain, during the boom of the 1880s, a large number of wage earners planted vines on scrubland, using the profits to purchase small irrigated plots (Rivera y Casanova 1897:93–94).

⁵² United Kingdom. Parliamentary Papers (1878–79), F. R. Duval, no. 5517, p. 272.

tion were short because little wine could be carried over to the next harvest. By 1900 conditions had changed.

TRADITIONAL WINE-MAKING TECHNOLOGIES

The highly variable weather conditions facing most European growers implied that grapes needed to be collected quickly, crushed immediately, and the juice fermented. With the exception of fine wines such as port or champagne, or where climatic conditions were sufficiently hot and dry to allow good-quality grapes to be produced most years, virtually all growers preferred to make their own wines. This gave them much more time to find a buyer (or drink the wine themselves) than if they had tried to sell the grapes.⁵³ There were few economies of scale in traditional wine making, and although the cellar and wine-making equipment, such as presses or storage vessels, were expensive, they were often used over several generations, so production costs per hectoliter of wine differed little between small and large producers.

According to Joslyn and Cruess, “if the fermentation is skillfully conducted, fair wine may be made from relatively inferior grapes, while mistakes at this stage will spoil wine made from the best grape.”⁵⁴ As the chemical composition of the grapes and the weather during fermentation varied even on a daily basis, producers had to know how to make the necessary adjustments in the fermenting vat. Before Pasteur showed that the spoilage of wine was due to aerobic microorganisms producing acetic acid, which could be avoided by careful wine-making techniques, there was limited knowledge of why wines were good in some years but undrinkable in others. Wine making was often poorly carried out, and Maynard Amerine, for many years chairman of the department of Viticulture and Enology at the University of California, Davis, thought that in the mid-nineteenth century at least 25 percent of the wine spoiled before fermentation was complete, and much of the wine was of a very poor quality.⁵⁵ The roles of yeasts, bacteria, enzymes, sugar, and oxygen were largely unknown, and white wines were “usually oxidized in flavor and brown in color; most red wines were high in volatile acidity and often low in alcohol.”⁵⁶ L. Roos, director of the enological station at Hérault at the turn of the twentieth century, noted that wine produc-

⁵³ Growers would not know the quality of their grapes until they were actually at the winery door, giving excessive power to the winery owner during the price negotiations. In addition, after a large harvest, a winery owner might be unwilling to buy grapes. The relatively high prices of port or champagne allowed winery owners to offer growers a guaranteed market for their grapes. The appearance of specialized grape growers in hot climates is discussed in part 4.

⁵⁴ Joslyn and Cruess (1934:12).

⁵⁵ Amerine and Singleton (1977:21).

⁵⁶ Arata (1903:200–1); and Amerine (1973:63), cited in Pinney (1989:354).

ers “acted without method” and asked: “Are there many vigneronns who are able to recall the behaviour of particular vatfuls of the preceding year, the diverse phases of their fermentation, or who possess such a stock of observations as to enable them to deduce the best conditions for the vinous fermentations? They are *rare aves*.”⁵⁷

The first step in wine making is to collect the grapes at the correct stage of ripeness, as this has a major influence on the character of fermentation and wine quality. Growing grapes was difficult in northern Europe’s damp and cool climate, but the lower temperatures during fermentation made wine making easier, and the grape’s greater natural acidity helped keep the wine free of bacteria. The wines in general were weaker in alcohol content but were cleaner, had more bouquet, and lasted longer. From the eighteenth century some writers recommended the addition of sugar to increase the alcohol content and thus help preserve the wine, and Chaptal gave this widespread publicity in his *Traité théorique et pratique sur la culture de la vigne* (Paris, 1801). Chaptal suggested grape concentrates, partly no doubt because cane sugar at this time was so expensive. Technical improvements in the refining process from the 1820s encouraged the spread of sugar beet production, but prices remained too high for it to be used in commercial wine production on any great scale until the late nineteenth century.

By contrast in hot climates, grapes developed relatively free from disease and with high sugar content, allowing a natural strength in excess of 12 percent. Fermentation, however, was liable to stop prematurely as the wine yeasts weakened when the temperature of the must increased above 35°C, which created favorable conditions for dangerous bacteria to develop, producing volatile acids and mannite that made the wines unstable, imparted disagreeable flavors, and resulted in persistent cloudiness.⁵⁸ These wines also suffered because of their lack of acidity, and gypsum (calcium sulfate or plaster of Paris) was often added in southern Europe during fermentation. By the late nineteenth century a number of scientists and wine writers argued that this practice caused a health risk, and its use was banned or restricted in some wine regions.⁵⁹ Tartaric acid was recommended instead, either being added to the grapes in the crusher, or spread over the vat while it was being filled.⁶⁰

As on the vineyards, labor was the producer’s major cost, and this was mostly supplied by the family. Grapes were crushed by treading (*foulage*), a tedious and expensive operation, which in Jerez, for example, resulted in a worker

⁵⁷ Roos (1900:11).

⁵⁸ Bioletti (1905:20).

⁵⁹ In France it was effectively banned by the 1891 law that limited the amount that could be added to two grams per liter (Roos 1900:148). For the use of calcium sulphate in Spain, see Archivo Ministerio de Agricultura, leg. 81–82; Exposición Vinícola Nacional (1878–79:392, 645); and Hidalgo Tablada (1880:173–74).

⁶⁰ Roos (1900:148) argued that “*it is better to completely reject this method.*” Emphasis in the original.

crushing only between 4 and 6 tons a day.⁶¹ However, except on the smallest holdings or in areas of fine wines, mechanical crushers had replaced treading in most French wineries by 1914.⁶² The simplest and best known consisted of two cylinders operated by hand, which crushed three tons an hour, but it was heavy work and required four men who took turns to operate it.⁶³ Mechanical crushers were rare among fine wine producers because they crushed the grape seeds and released excessive amounts of tannin into the wine.⁶⁴ Thus in Bordeaux it was noted in 1883 that “many machines have been invented for crushing the grape, but none have replaced, *in our vineyards*, the foot of man, the weight of whose body is heavy enough to crush the grains, and the sole of the foot sufficiently flexible to avoid crushing the sour grapes or breaking the stones, which later impart a very disagreeable taste to the wines. This is the only means employed in Medoc.”⁶⁵

Red wines were made with the juice, skins, and pips, and in some regions, such as Bordeaux, with stem fragments. Grape stems had also been present during wine-making in southern France, and, according to Coste-Floret in the 1890s, this led to the production of poor red wine that met the “depraved taste of a certain class of consumers who formerly drank our common wines . . . but who appear to have now abandoned us.” By contrast, Roos believed it was poor wine-making methods, rather than the presence of stems, that caused the region’s inferior wines at this time.⁶⁶

The crushed grapes were fermented in vats. A good fermentation requires healthy, abundant, and vigorous yeasts, which are found naturally on the grape’s surface, as well as the presence of oxygen and a favorable temperature of between about 25 and 35 degrees. Fermentation converts sugar to alcohol and gives off carbon dioxide, which pushes the solid material to the top of the vat to form a cap (*chapeau*), where the alcohol and heat produced during fermentation extract color and tannin. The cap has to be kept submerged to avoid acetic acid forming, and various devices were introduced within the vat to automatically keep it below the surface, although Paul Pacottet argued that it was only the labor shortages from 1890 in southern France that caused them to

⁶¹ *Ibid.*, 56. Marcilla Arrazola (1949–50, 2:69–70).

⁶² Mandeville (1914:72). In Spain, the two principal surveys in the late nineteenth century (Exposición Vinícola Nacional 1878–79; Spain, Ministerio de Fomento 1886) rarely mention mechanical crushers. See also Elías de Molins (1904:102).

⁶³ Roos (1900:58). Grape yields were also low. See also Coste-Floret (1894:27).

⁶⁴ Mechanical crushers were still rare in the 1960s in the production of port and sherry (Croft-Cooke 1957:72; Jeffs 2004:170). Another difficulty was the imperfect aeration in cylinder crushers, although this could be resolved by allowing the grapes to travel along an open shuttle (Roos 1900:73).

⁶⁵ Cocks and Féret (1883:59). My emphasis.

⁶⁶ Roos (1900:68–70). Grape stems contain tannin and, if broken during the fermentation, leave wine bitter and astringent, as well as slightly reducing alcoholic content and color (Robinson 2006:227).

become widespread.⁶⁷ White wine can be made from either white or red grapes (without the presence of the solid parts), with the former being easier to produce, but the latter producing a better-quality wine.

The size of the vats needed to approximate the quantity of grapes collected in a single day, but very large vats were already being rejected in some places by the 1880s because of the excessive temperatures that large quantities of fermenting wine generated.⁶⁸ The choice of the material used was less important than the need for it to be easily cleaned so as not to impair the taste or the chemical composition of the wine, as well as to maximize heat loss caused by the fermentation. In Spain, for example, where wood was often scarce, wine was fermented in stone, cement, or brick tanks, sometimes lined with tiles or plaster, and large earthenware containers (*tinajas*).⁶⁹

The time needed for fermentation varied greatly, depending on the temperature in the vat, whether white or red wines were being made, and according to “custom and experience.”⁷⁰ As a long fermentation increased the threat of oxidation and the wine turning sour, it was usually brought to an end after six or eight days.⁷¹ The length of time the must remained in contact with the marc (the residue of the grapes) in the fermenting vat also varied significantly according to “the nature of the wine it is proposed to make, to the *cépage* used, to the method of fermentation adopted, the temperature of the vat, and the manipulation the must undergoes during fermentation.” In southern France it was usually three or four days but lasted “eight days when the temperature does not exceed 30°C.”⁷² The wine was then racked (separated from the lees or solid matter) into casks and stored in the cellar to mature, and occasionally fined, before being sold.⁷³

⁶⁷ Pacottet (1924:169). Chaptal had argued for fermentation to be carried out in airtight vats, and although the larger growers in Bordeaux and the Midi began to do this, many specialists questioned the need when fermentation was carried out rapidly. See especially Loubère (1978: 99–101).

⁶⁸ In Bordeaux we read in 1883 that “The vats of 20 tuns are becoming very uncommon, as expert workmen have recognized that the capacity of 10 tuns, in large vineyards, is that which harmonizes best with the conditions of a good vinification, which cannot be guaranteed unless the vats have been filled in 24 hours, so that fermentation may not be disturbed” (Cocks and Férét 1883:55–56). This passage is absent in the second French edition (1868).

⁶⁹ The advantage of the *tinajas* were that they were cheap and easily cleaned, and the temperature of the must reduced as heat loss was high. They were fragile, however, and there were difficulties in removing the wine from the lees (Marcilla Arrazola 1949–50, 2:163).

⁷⁰ Manuel de l’agriculteur du Midi (1831:141). Today red wine fermentations are usually complete within four to seven days, but white wines, which are fermented at a much lower temperature, may take several weeks (Robinson 2006:770).

⁷¹ Loubère (1978:98). The *Manuel de l’agriculteur du Midi* (1831:141) gives a minimum of three and a maximum of nine days. However, the same source notes that a few growers left the wine in the vat for as little as 24 hours, while others left it a couple of weeks.

⁷² Roos (1900:145, 147).

⁷³ A variety of products were used for fining wines, including the whites of eggs, fish glue, and animal blood, and in regions such as Valencia or Barcelona it was carried out by middlemen or exporters rather than individual producers (Spain, Ministerio de Fomento 1886:83–87).

Most wines had to be drunk within about nine months, and because the wooden barrels in which they were traditionally stored and shipped were porous, “wines evaporated from within, air penetrated from without, and unless the barrels were ‘topped up’ (kept full) the wines, especially the more fragile varieties quickly deteriorated.”⁷⁴ Many wine producers, especially the smaller ones, were anxious to sell the wine as quickly as possible. By selling it directly from the vat, the grower avoided the costly duplication of storage capacity, which in many instances they did not possess.⁷⁵

The addition of water and sugar to the marc allowed a second, thin wine (*piquette*) to be produced. In the mid-nineteenth century most of the presses were bulky and made of wood and required several men to operate, but by the early 1880s an increasing number were of iron and worked by animals.⁷⁶ The second wines were traditionally reserved for farm laborers and family, but during the phylloxera shortages they were often marketed as wine.

Finally, distilling of surplus or poor wines was traditionally widespread in wine-producing countries. Stills were simple and often portable, but by the mid-eighteenth century technical change, improved communications, and growing demand encouraged specialization for cheap spirits in a number of regions, including the Midi and Catalonia.⁷⁷ However, the prices paid for wines used for distilling were low, and the process virtually disappeared during the very high wine prices in the 1870s and 1880s.

MARKETS, INSTITUTIONS, AND WINE CONSUMPTION

High transport costs in the prerailway age meant that wines were produced over large geographical areas and consumed locally. Those remaining in the cellar on eve of the harvest were thrown out to make way for the more valuable new wine, and stocks played only a very small role in smoothing out supply from one year to the next. Per capita consumption therefore fluctuated with the size of the local harvest. The harvests of 1865 and 1866 were so large in the Midi, for example, that consumers in *les cabarets* bought their wine by units of time—one *sou* an hour—rather than by the quantity they drank.⁷⁸ By contrast, Richard Ford noted in the 1840s that the Spaniard “drinks the wine that grows in the nearest vine-

⁷⁴ Gough (1998:80).

⁷⁵ Richard Ford noted for Valdepeñas (La Mancha) in the 1840s that “the red blood of this ‘valley of stones’ issues with such abundance, that quantities of old wine are often thrown away, for the want of skins, jars, and casks into which to place the new” (1846/1970:161). In Barcelona in the 1880s, for example, “only in some coastal regions and in Villafranca de Penadés were there containers where the wine could be conserved, and generally the growers left it in the fermenting vats (*trujales* or *cubas*) until they sold it” (Spain, Archivo Ministerio de Agricultura, leg. 81–83).

⁷⁶ Cocks and Féret (1883:62).

⁷⁷ For the Midi, see Augé-Laribé (1907:36–42) and Pech (1975); for Catalonia, Vilar (1980: 234–35), Segarra Blasco (1994), and Valls Junyent (1996).

⁷⁸ Augé-Laribé (1907:84). For price elasticities of wine, see chapter 2.

yards, and if there are none, then regales himself with the water from the least distant spring.”⁷⁹ Yet local consumption did not necessarily imply peasant self-sufficiency. In France in 1852, when the country still possessed only 3,654 kilometers of railways, 56 percent of wine was sold outside the *arrondissement* of production, compared with 31 percent of meat and 13 percent of wheat.⁸⁰ Even for wheat it has been argued that if most was consumed locally, “we can be sure that perhaps 70 percent of net output was marketed.”⁸¹ In Italy, household budget surveys for a slightly later period also suggest that farmers bought and sold extensively in markets.⁸²

A major demand restriction was the low level of urbanization, with only 8.8 percent of France’s population living in urban centers in 1800, 14.6 percent of Italy’s, and 11.1 percent of Spain’s.⁸³ Even these modest figures encouraged some market specialization, although the production and sale of wines were often carefully regulated in the *ancien régime*. In 1577 the *parlement* of Paris prohibited local retailers (*débitants*) from buying wines within a zone of 20 leagues (88 kilometers) of the capital, a measure that was abolished only in 1776.⁸⁴ The aim in part was to encourage trade and hence increase royal revenues, and for two centuries the Île-de-France ceased to supply the capital with wines and the land was used for cereals and sheep farming. The population of Paris increased from 130,000 in 1550 to 430,000 a century later, reaching 576,000 in 1750. By 1800 it totaled 581,000, six times the size of the next largest French city, and was the focus of the nation’s long distance trade.⁸⁵ The small, family growers of northern France—Champagne, the upper Loire, and lower Burgundy—responded to the Parisian demand:

The wine produced in the north of France had long enjoyed a reputation for its quality, but the populace of Paris demanded vast quantities of cheap wine. The good wine had been the result of the pinot noir or, in the upper Loire, the related auvernat grapes, grown on the best slopes, which produced a low yield of rich, complex wine. In response to Parisian demand, the regions within reach of Paris turned increasingly to high-yielding grapes, such as the gamay or gros noir, that could grow even on flat land and make an abundance of cheap, unsophisticated wine.⁸⁶

⁷⁹ Ford (1846/1970:159).

⁸⁰ Demonet (1990:215). See also Postel-Vinay and Robin (1992:496). An *arrondissement* was typically twenty miles across.”

⁸¹ Postel-Vinay and Robin (1992:497).

⁸² Federico (1994).

⁸³ De Vries (1984:45). Urban centers were considered to have ten thousand inhabitants or more.

⁸⁴ For administrative purposes the exclusion area was not circular but connected different towns at approximately this distance. A number of exemptions implied that only about three quarters of the capital’s wine was supplied outside this radius (Garrier 1998:169).

⁸⁵ De Vries (1984:273–75). For the Paris wine market, see Dion (1977, chap. 16); Lachiver (1982); and Brennan (1988).

⁸⁶ Brennan (1997:6–7).

By contrast, the incentives for change in those areas outside the direct influence of the Parisian market were much less. The historian Roger Dion explains the survival of Chablis' wines into the twentieth century, almost alone among all the ancient wines of lower Burgundy, by the disadvantage the region suffered from being so far from the Yonne River:

Beyond a certain distance from water routes, the cost of carting to the nearest river port passes a certain price, the exportation ceases to be advantageous for wines of little value and can only be contemplated for wines of quality. Hence the vineyards of Chablis, inaccessible to commercial shipping, remained faithful to the pinot blanc grape, a vine of quality that many of the vigneronns closer to the river routes had abandoned in order to respond to the demands of Parisian commerce.⁸⁷

The same was also true concerning the sale of wines from France's major port, Bordeaux. Growers over a large area of southwestern France were linked by navigable rivers to Bordeaux, and from there to the export markets of northern Europe. From an early date Bordeaux's local wines enjoyed important privileges—the *senéchaussée privilégiée*—in both the city and export markets.⁸⁸ Details changed over time, but the preamble to the Royal Edict of 1776, which abolished these privileges, provides a good indicator of their general nature: wines from outside the city could not be sold before Christmas, and “thus the wine growers of the Haut Pays cannot profit from selling their wine at the most profitable time.”⁸⁹ When wines were admitted, they could be sold only with numerous restrictions, to the distinct advantage of the Bordeaux growers. The debates concerning privileges of this nature were resurrected in the early twentieth century with the demand for regional appellations (chapter 5).

Wines everywhere were taxed by local, and sometimes national, authorities. The duty was usually levied by volume and consequently, as a percentage of the final price, was heaviest on cheaper wines.⁹⁰ Most wines were sold directly from the barrel, and bottles, except for those taken by consumers to taverns to be refilled, were irrelevant for much of the trade. Unlike fine wines, commodity wines were not sold under brand names, but in a world where many economic decisions were carried out face to face, reputation played a major role in the trade. Consumers might be unable to tell exactly what had been added to the wine they were drinking or where it had been produced, but they could make a choice of which retailer to frequent, being influenced no doubt by that person's reputation for fairness, quality, price, or good company.

⁸⁷ Dion (1977:553), cited and translated by Brennan (1997:133–34).

⁸⁸ Kehrig (1884:4).

⁸⁹ Dion (1977:393). The potential trade from the Midi with the opening of the Canal des Deux-Mers in 1681 was limited therefore. Legal restrictions also existed limiting the spread of vines at the expense of cereal in eighteenth-century France.

⁹⁰ Franck, Johnson, and Nye (2010).

THE DEVELOPMENT OF FINE EXPORT WINES

Most wines were considered items for everyday consumption, and their markets were limited by their poor keeping quality, high transport costs, and taxation. Yet long before the mid-nineteenth century, a handful of wines had been created in select regions such as Bordeaux, Porto, or Jerez that were very different. In particular, between the mid-seventeenth and late eighteenth centuries, the production of specialized fine wines underwent changes that were as spectacular as any of those that took place in Britain during the so called Agricultural Revolution over the same period. André Jullien, in his classic *Topographie de tous les vignobles connus*, shows that the major areas of fine wine production were already well established by 1816, and it was only with the appearance of fine wines in the New World over the final couple of decades of the twentieth century that this map was radically changed. However, the nature of these fine wines was completely transformed over the seventy or eighty years prior to the First World War, as consumers' preferences switched away from sweet and heavy wines toward lighter and drier ones, together with the development of vintage ports and champagnes.

Fine wines can be divided into two major categories: dessert wines, such as sherry, port, malaga, madeira, or tokay, which are fortified during production and whose additional alcoholic strength allows them to be kept for several years and withstand rough treatment and transportation without being ruined; and nonfortified ones, including claret, burgundy, and champagne. The production of quality distilled wines, such as cognac, also dates from the same period. In fine wine production, grapes had to be selected from shy-bearers grown in a few highly favorable sites, and producers needed considerable grape-growing and wine-making experience and large quantities of capital. Not only was Britain the most important market for many of these wines before 1914, but merchants contributed directly to the development of their styles in response to demands in that market.⁹¹

The addition of brandy stopped fermentation, and the remaining glucose left the wine sweet, while the high alcoholic content kept it stable, allowing it to be transported long distances without deteriorating. Port was a drink developed by British merchants, and the trade benefited greatly from the Methuen Treaty of 1703, which restricted duties on Portuguese wines to a maximum of two-thirds of the custom duties paid for French wines in the British market.⁹² Merchants experimented to find the best moment and quantity of brandy to be added during fermentation. According to Ralph Davis, until the mid-eighteenth century nearly all wines were drunk during the year of making but, “between 1780 and

⁹¹ This is dealt with in more detail in part 3.

⁹² Nye (2007); Simpson (2010).

1830 the occasional practice of allowing long maturity for port and sherry became general. . . . [In 1780] very little wine was kept for more than two years; by the latter, it was taken for granted that port should be kept in a bottle for ten to fifteen years to develop the genuine aroma of the wine, and that sherry needed to be mellowed by at least five years in cast, and did not attain its full perfection for fifteen to twenty years.”⁹³

Madeira’s producers benefited from favorable trade winds that brought American-bound ships to its port, and the tax privileges granted in the British Sugar Act (1764). If the wine they produced in 1640 was cheap and simple, “made from a base of white must to which growers and exporters added varying amounts of red must in order to give it color and flavor,” by 1800 it was “a complex, highly processed, expensive, and status-laden beverage.”⁹⁴ One drawback of adding lower-density alcohol such as brandy was that it produced “a harsh, bracing, and often uneven taste,” which required wines to be matured for much longer. Shippers observed, however, that this process was speeded by long sea voyages, and the improvement was even more rapid when the journey was to a hot climate. Wine was deliberately sent via the West Indies as early as 1749, and via the East Indies in 1772, and a circuit of “floating ovens” had been established by 1775. The American Revolutionary War led to producers and exporters shifting the process of heating to Madeira itself, with the creation of stoves, ovens, and hothouses. Steam engines were installed to artificially create the conditions of a ship’s movement. According to David Hancock, “a wine that would be palatable to Americans only after four or five years in England, three years in Madeira, or one year in the East or West Indies could be readied in a stove in three or six months.”⁹⁵

Sherry also became popular, especially from the early nineteenth century. In 1772 Jean Haurie successfully challenged the growers’ guild and removed the institutional restrictions to shippers making and storing their own wines, and the development of the solera system of production gave them considerable flexibility to allow merchants to blend wines of a consistent nature and quality, and for British retailers to establish their own brands.⁹⁶ As with port and madeira, it was the ingenuity of the producers and shippers, mainly British, who changed wine-making procedures in response to market demand in their home and colonial markets. The capital requirements for production and trade soared with the increasingly complexity of these wines from the late eighteenth century.

By contrast, the best and most expensive nonfortified wines were produced in northern Europe.⁹⁷ Before the late seventeenth century, when bottles and corks began to be used to protect the wine from air, wines had to be drunk within a

⁹³ Davis (1972:96).

⁹⁴ Hancock (2009:73).

⁹⁵ *Ibid.*, 89, 92–93.

⁹⁶ For the solera, see chapter 8.

⁹⁷ Berget (1908) links the presence of fine wines and difficult growing conditions.

year of their production, and most Bordeaux wines were shipped, if not before Christmas, then in the early spring.⁹⁸ The development of fine wines in the Bordeaux region can be dated to between about 1650 and 1740. In 1647 the highest prices paid for wines were for those produced in the Palus region, but by 1730 in real terms these had changed very little, while the best Médoc wines now sold for five or six times more.⁹⁹ Perhaps the most famous wine ever drunk was the Ho Bryan that Samuel Pepys enjoyed on April 10, 1663, which he noted “hath a good and most perticular taste that I never met with.”¹⁰⁰ By the early eighteenth century, all Bordeaux’s first growths appeared to have been drunk with a certain frequency in Britain, which was a more important market than Paris. In 1797 Christie’s sold its first vintage claret, six hogsheads of “first-growth claret” of 1791.¹⁰¹ Among Bordeaux’s thousands of small vineyards producing common table wines, there were now approximately 250 vineyards, often owned by the nobility, that produced 80,000 hectoliters of fine wines and covered some 3,200 hectares.¹⁰²

The creation of burgundy and champagne has been explained by the response of growers and *négociants* to lost markets for their traditional wines.¹⁰³ The improvements in water transportation in the seventeenth and eighteenth centuries opened up the rapidly growing Parisian market to the wines of lower Burgundy, which in the case of Beaujolais “was practically created” by this trade.¹⁰⁴ However, this reduced the competitiveness of the wines from northern Burgundy along the Côte d’Or, and it encouraged growers to produce better-quality wines for foreign markets. The same was true in the Champagne region. The late seventeenth and early eighteenth centuries saw major advances in knowledge concerning the production of sparkling wines. This trade was very risky, not least because of the difficulties in controlling the second fermentation and the large losses through broken bottles. Thomas Brennan suggests that it was only the difficulties surrounding unsold young wines for the Paris market that encouraged some growers to turn to bottling. Therefore, “in both Burgundy and Champagne, commercial difficulties pushed growers and brokers away from mass markets, which were all too stagnant from growing com-

⁹⁸ The inability to store wines for any length of time followed the replacement of sealed amphorae by the use of wooden barrels at the end of the second century AD (Unwin 1991:13).

⁹⁹ Lachiver (1988:294–302).

¹⁰⁰ Latham and Matthews (1970, 4:100).

¹⁰¹ The *London Gazette* of 1707 advertised wines from the châteaux “Margaux,” “La Tour,” and “Lafitte” as “New French Prize Clarets” (Pijassou 1980:372–79). Walpole consumed large quantities of Margaux, Lafite, and Pontac (Ray 1968; and especially Penning-Rowse 1973:108–10).

¹⁰² Lachiver (1988:303).

¹⁰³ Brennan (1997:240). Theoretically *négociants* worked for themselves whereas brokers worked for others, although Brennan (p. 209) argues there was often some overlapping of their functions.

¹⁰⁴ *Ibid.*, 210.

petition, and toward elite markets.”¹⁰⁵ To sell the expensive wines, local brokers were forced to look for new markets instead of waiting for buyers to appear.¹⁰⁶ Once again, by controlling sales in distant markets, producers were able to create brand names that have lasted until today.

Finally, this process of specialist wine production was accompanied by the rapid growth from the eighteenth century in the distilling of wines. The ageing of spirits had become well understood in Cognac by the 1720s, and growers were switching from producing sweet white wines to acidic ones. Unlike most wines, these needed to be distilled only twice, resulting in a superior brandy to those produced elsewhere.¹⁰⁷ Important local families, such as Otard, Dupuy, Hennessy, and Martell, which would dominate the future trade, were already present by 1760. If Dutch buyers had originally turned what had previously been a small, widely diffused activity into a commercial enterprise, by the late eighteenth century England had established itself as the major market for quality brandy. According to the merchant James Delamain, the best judges of good cognac were to be found in London in 1788.¹⁰⁸ As with all successful beverages, by the turn of the nineteenth century cognac was attracting an increasing number of imitations.¹⁰⁹

European producers over the centuries learned to specialize and develop wines suitable for their particular terroir and markets, and major geographical shifts to new areas occurred well before the railways, as Alexander Henderson noted in *History of Ancient and Modern Wines*, published in 1824:

In tracing the history of French wines, we are struck with the fact, that many vineyards, which have now little or no repute, were renowned in former times for the excellence of their growths; while those which, of late years, have maintained the greatest celebrity, were then unknown, or almost unnoticed. Thus, the wines of Orleans and of the Isle of France were at one time in greater estimation than those of Burgundy and Champagne; and even Mantes, which is on the borders of Normandy, was famed for the produce of its vines.¹¹⁰

The railways would give growers the opportunity to plant new vineyards on land that had previously been considered unsuitable for commercial wine production and to compete with the old traditional areas. As Europe’s population grew during the first two-thirds of the nineteenth century, so too did the area under vines. In France it is estimated that the area increased from about 1.6 million hectares in the late eighteenth century to a maximum of 2.5 million in

¹⁰⁵ Ibid., 240.

¹⁰⁶ Ibid., 209.

¹⁰⁷ Faith (2004:63); Cullen (1998:45).

¹⁰⁸ Cullen (1998:4, 17, 95–96).

¹⁰⁹ Lachiver (1988:582–83).

¹¹⁰ Henderson (1824:146).

1874.¹¹¹ In Spain no reliable figures exist, but the area of vines perhaps increased from just under a million hectares in 1800 to just under two million in the mid-1880s.¹¹² In Italy, the widespread use of intercropping in the center and north of the country makes it difficult to establish accurately the area of vines even at the end of the period, but contemporaries speak of a similar growth.

The appearance of new commercial opportunities coincided with scientific research that began to unravel the secrets of the wine-making process. Yet even with limited scientific knowledge, some fine wines were produced and sold at what contemporaries considered astronomical prices in the early nineteenth century. As growers looked to plant vines in new areas, they naturally were attracted to the fame and high prices achieved by the top producers in places such as Bordeaux or Reims. Indeed, the poor quality of much of the imported wines found in the United States or Argentina that purportedly came from the leading wine estates led local growers in places such as California and Mendoza to believe that they could successfully compete. However, the challenge of producing a fine wine that could be sold at a significant price premium was considerable. James Busby noted in the 1830s that three major factors explained why a few wines were consistently better and sold at high prices. In the parlance of the twenty-first century, these were location, human capital, and physical capital. Busby was essentially interested in the vine's prospects for the New World (and especially New South Wales), so his greater emphasis on human and physical capital than on terroir is of special interest. His comments are worth quoting in full:

The limited extent of the first rate vineyards is proverbial, and writers upon the subject have almost universally concluded that it is in vain to attempt accounting for the amazing differences which are frequently observed in the produce of vineyards similar in soil and in every other respect, and separated from each other only by a fence, or a footpath. My own observations have led me to believe, that there is more of quackery than of truth in this. In all those districts which produce wines of reputation, some few individuals have seen the advantage of selecting a variety of grape, and of managing its culture so as to bring it to the highest state of perfection of which it is capable. The same care has been extended to the making, and subsequent management of their wine, by seizing the most favourable moment for the vintage,—by the rapidity with which the grapes are gathered and pressed, so that the whole contents of each vat may be exactly in the same state, and a simultaneous and equal fermentation be secured throughout,—by exercising equal discrimination and care in the time and manner of drawing off the wine, and in its subsequent treatment in the vats or casks where it is kept,—and lastly, by not selling the wine till it should have acquired all the perfection which it could acquire from age, and by selling, as the produce of their own vineyards, only such vintages as were calculated to acquire or maintain its

¹¹¹ Lachiver (1988:582).

¹¹² See Pan-Montojo (1994:384–93); Simpson (1986).

celebrity. By these means have the vineyards of a few individuals acquired a reputation which has enabled the proprietors to command almost their own prices for their wines; and it was evidently the interest of such persons, that the excellence of their wines should be imputed to a peculiarity in the soil, rather than a system of management which others might imitate. It is evident, however, that for all this a command of capital is required which is not often found among proprietors of vineyards; and to this cause, more than to any other, it is undoubtedly to be traced, that a few celebrated properties have acquired, and maintained, almost a monopoly in the production of fine wines.¹¹³

Yet for the great majority of wine producers, to improve quality and make a profit were two quite different and often incompatible objectives. While some producers might call their wines claret or sherry, the economic incentives for the vast majority were to attempt to maximize production. Vineyard location, grape choice, pruning method, and a whole host of other variables were chosen to produce a wine that the consumer wanted, namely, one that was cheap. Only in the last couple of decades of the twentieth century did wine-making technology change sufficiently to allow fine wines to be made outside a few chosen areas, such as the Médoc, and were there sufficient consumers willing to pay high enough prices to make it economically sensible to invest heavily in regions such as Carneros or the Ribera del Duero. In this respect perhaps the surprising feature of the so-called Judgment of Paris blind wine tasting in 1976 was not that some of France's leading connoisseurs preferred California wines to those from their own country, but rather that a winery such as Stag's Leap Wine Cellars had been operational for only four years. All this is a far cry from the mid-nineteenth century, when 99 percent of producers were happy just to be able to produce wine that was sufficiently drinkable that it could be sold.

Finally, taxes on alcoholic beverages seriously distorted markets, with tariffs in most producer countries limiting imports to just fine wines. In Britain, taxes on all types of alcohol contributed 36 percent of national revenue in 1898–99, but they were also 19 percent in France (1898), 18 percent in Germany (1897–98), and 28 percent in the United States (1897–98).¹¹⁴ In addition, wine provided significant revenues for local governments in producer countries, further restricting demand and market specialization. Merchants talked of consumer taste, but then, as today, this was often shaped by the prevailing tax regime.

¹¹³ Busby (1833:106–7). Charles Higounet (1993: 110) notes that “from the eighteenth century onwards what differentiates the leading Médocain wine château from the small or average sized peasant of *bourgeois* property is the ability and the willingness to invest often considerable amounts of capital to improve the *terroir*, the natural source of the product.”

¹¹⁴ Tax figures given in *Ridley's Wine and Spirit Trade Circular*, April 12, 1900, p. 258, hereafter cited as *Ridley's*.