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Wine and Portugal: A Brief History

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This article discusses the history of wine in (what is now) Portugal, within the global history of the region. The Phoenicians brought wine and viticulture to the southern and western coasts of Iberia in the eighth century BCE. The Romans expanded viticulture to the entire Peninsula in the late second century BCE. Wine survived the 'Barbarian' invasions and centuries of Islamic rule. A revival of viticulture followed the capture of Lisbon by Afonso Henriques in 1147. In the early days of the age of exploration, Portugal developed trade routes to Africa, India, the Far East, and South America. The long-distance sailing was facilitated by the colonization of the Madeira and Açores (Azores) archipelagos. The wines produced there became famous, especially in England and North America. The fortification of wine in the late seventeenth century resulted in the emergence of modern Madeiras and Ports. Following the 1755 'Lisbon' earthquake, Pombal imposed strict geographical delimitations and winemaking rules in the Douro. Napoleon's Peninsular War devastated the Portuguese economy, and then viticulture was badly hit by oïdium and phylloxera, the First World War, the Great Depression, Prohibition, and the Second World War. Portuguese wines finally emerged on the world scene after the Salazar dictatorship.

Introduction

'Portugal' evolved from *Portus Cale*, the 'port of Cale', where the Douro river could be crossed in the past: today's Porto and Vila Nova de Gaia (Magarinhos 2011). 'Cale' may originate from a Celtic word for port (https://en.wikipedia.org/wiki/Portugal). It became Calécia, then Gallaecia, now Galicia.

The land area of Portugal, including the Açores and Madeira archipelagos, is about 92,400 km^2. Its only land border is with Spain: Galicia in the north, Castilla y

León in the east, then Extremadura, and Andalusia. Even though a few miles of this border near the town of Olivença are disputed, it is the oldest border within the European Union, established in 1297 by the Treaty of Alcañices. The most important Portuguese rivers flow into the Atlantic: the Minho, Douro, Mondego, Tagus, and Guadiana. Part of the Minho is the border with Galicia, part of the Tagus and Guadiana are the border with Extremadura and Andalusia, respectively.

In 2024, the total area under vines was about 180,360 ha, less than in 2020 (194,000 ha, Forbes 2021), or the peak of 249,000 ha reached in 2006. Some 14% of Portugal's planted agricultural area consists of vineyards, the largest percentage in the world (Almeida Costa *et al*. 2021). Portugal produces an astonishing array of wines, most from indigenous cultivars. These include fortified wines, sparkling, white, rosé, red, and dessert wines, as well as historic wines (*Vinhos Históricos de Portugal*) characterized by unique geographical conditions, traditional cultivars, ancestral viticulture and/or oenological practices (Loureiro 2009; Almeida Costa *et al*. 2021). This article discusses the key events in the history of this country and its wines.

From the Early Days to the First Wines

Iberia Before Wine

By the time the kingdom of Portugal was born in 1143, its territory had been inhabited for thousands of years. Homo sapiens arrived from the south about 42,000 years ago (Carvalho, A.F. 2022), but it is the end of the last major Ice Age – some 20,000 years ago – that brought significant numbers of hunter-gatherers. They migrated north along the Atlantic coast to the Tagus and Mondego estuaries, and then to Galicia, Brittany, and England (Cunliffe 2018). That was long before viticulture.

Around 5500 BCE, new waves of people arrived in Iberia, mostly from the north-east (Zapata *et al*. 2004; Bernabeu Aubán *et al.,* 2017; Cunliffe 2018; Cortell-Nicolau *et al*. 2021). They spoke Indo-European languages (Cunliffe 2018) and brought with them the 'Neolithic package': pottery, agriculture, domesticated animals (goats, sheep, pigs, cows, etc.) and crops (wheat, barley, peas, lentils, etc.) – but not viticulture. Their influence spread along the coast all the way to today's Portugal, then inland following the rivers. These Neolithic newcomers displaced or absorbed the local hunter-gatherers.

Metallurgy (copper, silver, gold) appeared c. 3000 BCE. The mobility of people increased from the Tagus estuary to Galicia, Brittany, and then further north, possibly driven by a quest for metals. Deposits of tin, a key ingredient to turn copper into bronze, existed in Galicia and northern Portugal. The earliest tin-copper bronze in the region is dated c. 2100 BCE (Cunliffe 2018).

The diffusion of people and ideas from Portugal to the rest of Europe is illustrated by a distinct pottery style, the 'maritime-bell' beaker, so named because of its shape. It originated around 2750 BCE along the Tagus river (Cardoso 2022). A few centuries

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later, it was found along the coasts of western Europe, and then inland, following the rivers. The spread of this type of pottery coincided with the appearance of Celtic place names (Cardoso 2022; Cunliffe 2018).

There is DNA evidence (Carvalho A.F. 2022) that, by c. 2500 BCE, people had developed tolerance for gluten, lactose, and ethanol. This implies that grain, dairy products, and fermented beverages, respectively, were consumed. But the latter involved some type of grain-based beer, not wine.

The population grew, and local cultures and urban centres appeared. The 'fortified-hilltop' (*castro*) culture occupied the north (northern Portugal, Galicia, Asturias) from the early iron age, c. nineth century BCE. The Lusitanians populated central Portugal and Extremadura, as the first Phoenician settlements appeared in the south of Spain and the estuary of the Tagus and Sado. The Celtic influence increased in the sixth century BCE, leading to the emergence of Celtiberian tribes in central and north-east Iberia.

The wild western *Vitis Vinifera Sylvestris* was present in Iberia and its fruits consumed before Neolithic times (Buxó 2009; Peña Cervantes 2020). However, no evidence of cultivation, domestication, or winemaking has been found. The pips of this dioecious grape are near-round while those of the domesticated (hermaphrodite) *V.V. Vinifera* are elongated (Estreicher 2019). Only wild pips are found in pre-Phoenician settlements without evidence of intentional fermentation such as accumulations of pips discarded after pressing, remains of wine presses or wine jars, chemical markers (residue in jars) such as tartaric acid and calcium tartrate, syringic acid and/or malvidin, succinic and/or pyruvic acid, etc. (Garnier and Valamoti 2016).

The Phoenicians

The earliest hint of Phoenician presence near the estuary of the Tagus consists of a few artifacts of near-eastern origin dated to the eleventh century BCE (Arruda 2009). They could have been associated with exploratory visits by daring traders. The Phoenicians were also importing silver from southern Iberia as early as the eleventh century BCE (Wood *et al.* 2020; Cline 2024). But the earliest Phoenician colonies in Sicily, Sardinia, and North Africa were established in the 950s BCE. The pace of settlement picked up in the nineth century BCE with several important colonies such as Carthage in North Africa (the legendary founding date is 814 BCE), Cádiz (founded at about the same time), and Huelva on the Atlantic coast of Spain, close to the border with Portugal. Cádiz grew into a large city, famous for its temple to the god Malqart. Many smaller colonies, 3 to 4 ha in size, dotted Portugal and the southern coast of Spain. The locations of these settlements coincide with river access to mining areas: silver, iron, copper, tin, and so on (Arruda 2009, 2019, 2022; Dietler 2009).

The Phoenicians did not just trade and seek metals. They extended agriculture, went fishing, gathered salt, collected timber, planted vineyards, and made wine. They also brought their language and alphabet. Over time, they assimilated with the local

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Figure 1. The Phoenician wine press at Castillo de Doña Blanca. Left: The grapes were trodden in the square area. The red arrow points to the opening through which the must would flow. Right: An amphora was placed under the opposite end of that opening to collect the must for fermentation and storage (photo: SKE).

populations, which learned to write. There is evidence (Peña Cervantes 2020; Sanmarti 2009; Harutyunyan and Malfeito-Ferreira 2022) of cultivation and wine production in eastern Iberia since the earliest days of Phoenician settlements. An abundance of domesticated *V.V. Vinifera* pips dating back to the eighth or seventh century BCE have been found at Castillo de Doña Blanca (between Cádiz and Jerez). The oldest surviving 'lagar' in Iberia is located there (Figure 1).

There is no evidence of the domestication of the wild (western) *V.V. Sylvestris* in early Iberia. Such evidence exists, for example, in early bronze-age Greece (Pagnoux *et al.* 2021) and southern Italy (Breglia *et al.* 2023), where the wild-to-domesticated evolution of pips is clearly visible in the archaeological record. The absence of such a record in Iberia suggests that the Phoenicians brought cuttings of domesticated *V. Vinifera* with them. Over time, these cultivars crossed with local wild grapes, abundant in the basins of the Tagus, Sado, Guadiana, and other rivers (Harutyunyan and Malfeito-Ferreira 2022). Indeed, there is DNA evidence of wild and domesticated contributions in some of today's cultivars (Myles *et al.* 2011). The results were new 'Iberia-native' grapes, probably different on the east and west coasts of the Peninsula. Later, the Romans imported some of their favourite grapes, as did the Cistercians (starting in the twelfth century) who likely brought the Savagnin, the Trousseau (Bastardo in Portugal) and other French cultivars. These contributions further increased the diversity of vines in Portugal. But some Portuguese cultivars are directly related to local wild populations such as the Marufo (a red dioecious grape) and Vinhão (Harutyunyan and Malfeito-Ferreira 2022).

Small groups of Phoenicians from Huelva and Cádiz (Arruda 2022) sailed to Portugal and settled along the Tagus (Lisbon, Santarém, Almada) and Sado (Abul) rivers in the nineth century BCE. They were interested in mining, fishing, salt, timber, and slaves. There is later evidence of metallurgy (iron, silver, gold, bronze), glassmaking, ceramics, as well as cultivation. At first, wine was imported from Málaga and North Africa, but it was soon produced locally (Buxó 2009). In the middle of the eighth century, there was cultivation and breeding of domestic animals,

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as well as kilns for making amphorae to store and transport wine, olive oil, and salted fish (Lopez Castro 2019). The volumes of wine and oil produced were small, suggesting mostly local consumption by the elite. In the late seventh century, there were dozens of Phoenician colonies along the Tagus, Mondego, and Guadiana rivers, as well as inland.

By the early sixth century BCE, most Phoenician settlements had assimilated with the local populations and lost their near-eastern characteristics. In 539 BCE, Cyrus the Great conquered the Phoenician city-states along the coast of today's Lebanon, while Carthage (in North Africa) was growing into an empire. The Iberian settlements became incorporated into that empire (Dietler 2009). But a competing power was on the rise: Rome. Its arrival would completely change Iberia and result in a substantial expansion of viticulture.

Rome and the Expansion of Viticulture

Although the traditional founding date of Rome is 753 BCE, six decades after Carthage, some of the hills by the Tiber where Rome stands had been occupied earlier (Lomas 2018). Rome grew by absorbing its neighbours in central, southern, then northern Italy. Carthage developed a maritime trade empire in the central and western Mediterranean with colonies in Sicily, Sardinia, Corsica, and Iberia.

The 509 and 348 BCE treaties between Rome and Carthage defined their respective spheres of influence, but the 309 treaty (Cary 2012) suggests that these spheres were getting uncomfortably close to each other: it prohibited Romans from setting foot in Sicily and Carthaginians in Italy proper. Sicily and the control of the strait of Messina triggered the first Punic war (264-241 BCE) which was mostly fought at sea (Miles 2010). Rome defeated Carthage who had to pay a considerable tribute to Rome. That came from Iberia, rich in silver and other metal ores.

Carthage sent Hamilcar Barca to Iberia in 247 BCE. For the local tribes, this was more than the usual commercial interactions: it was a military invasion. The result was armed resistance. Hamilcar was killed in battle in southwest Spain during the winter of 228/9 BCE. His son-in-law Hasdrubal took charge. He founded Cartagena in 227, a centre of silver mining, and signed the Ebro treaty with Rome in 226 (Fabião 2022a). This treaty defined the boundary between Roman- and Carthaginian-controlled areas in Iberia: Rome north of the Iberus (Ebro) river and Carthage south of it. Hasdrubal was murdered in 221. Hannibal Barca, son of Hamilcar and sworn enemy of Rome, became the commander of the Carthaginian forces in Iberia.

In 220 BCE, Rome declared the city of Saguntum (Sagunto), well south of the Ebro, to be a Roman protectorate (Fabião 2022a). In response, Hannibal laid siege to the city, which fell in 219. This triggered the second Punic war (218–201 BCE). Hannibal marched his troops and war elephants through north-eastern Iberia, southern Gaul, and then over the Alps into Italy. He badly defeated several roman armies (Miles 2010). Rome first sent troops to eastern and southern Iberia to cut off

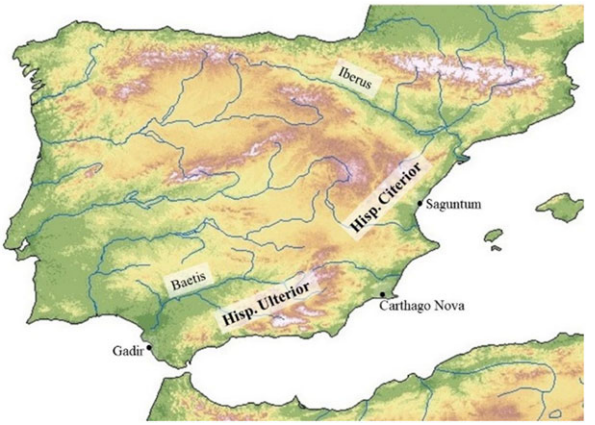

Figure 2. Division of Carthaginian Iberia into Hispania Citerior (closer to Rome) and Ulterior (farther away). The Iberus (Ebro) and Baetis (Guadalquivir) rivers are labelled (Wiki Commons map modified by SKE).

Hannibal's supplies. By 206, Cadiz was in Roman hands and the Carthaginian forces were out of Iberia (Fabião 2022a). Four years later, they were defeated at Zama in North Africa and the second Punic war was over.

Rome maintained a military presence in Iberia to prevent a return of Carthaginian forces (Silva 2011). This involved alliances with local tribes, and new taxes to be paid in silver, gold, and/or supplies for the army, including wine. Rome soon switched from being the liberator of Carthaginian oppressors to being the oppressors themselves. Roman Iberia was divided into Hispania Citerior and Ulterior (Figure 2). For decades, their governors kept fighting rebellious tribes with varying degrees of success.

The third Punic war involved the destruction of Carthage in 146 BCE. The threat of a Carthaginian return to Iberia disappeared and so did the reason for the Roman presence there. But Rome decided to incorporate Iberia and profit from its wealth: silver and lead near Cartagena, copper and silver from Andalusia to the Serra de Grândola, gold in Trás-os-Montes, agriculture along the Baetis (Guadalquivir), mining, fishing, salt in Lusitania, wine throughout the Peninsula . . .

However, the conquest of Iberia proved very challenging. The local tribes rebelled, and this degenerated into two Celtiberian wars (181–179 and 143–133 BCE) in what is today Spain, and two Lusitanian wars (151–151 and 147–138 BCE) mostly in today's Portugal (Silva 2011; Saraviva 2018; Guerra 2022). According to the Greek geographer Strabo (Júdice Gamito 2005), 'the Celtiberian women were as courageous as the men and did not hesitate to kill their children and themselves rather than be taken prisoners'. Decimus Brutus used a very similar language to describe the Lusitanians (Silva 2011; Saraviva 2018): 'men and women fought to the death, killed their children, and committed suicide rather than surrender'. When every fight is to the death, winning becomes very hard. The second Lusitanian war led by a man of humble origin but great leadership qualities: Viriathus (Muñoz

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2017). He rebuilt the Lusitanian forces, waged a guerilla war, and made life very difficult for the Romans. Algarve and Alentejo were integrated by Rome during that period. By 138 BCE, Rome controlled the Atlantic coast.

Olisipo (Lisbon) was fortified and its harbour expanded. Decimus Iunius Brutus led an expedition north of the Tagus, destroying *castros* along the way. He crossed the Douro at Porto Cale and continued up to the Minho. Julius Caesar, governor of Hisp. Ulterior in 61 BCE, systematically looted the region. He sent one-third of the loot to Rome, divided one-third among his troops, and kept one-third for himself (Page 2002); he had large debts to pay. By 26 BCE, Rome controlled the northern coast of Portugal and Spain all the way to Asturias and Cantabria. Except for the mountainous regions occupied by the Basques (visited but never conquered, Collins 1986), all of Iberia was Roman and at peace for almost 400 years.

Life completely changed. The Romans created administrative centres that became cities. They built an extensive network of roads. In the west, they linked Onoba (Huelva), Osonoba (Faro), Pax Iulia (Beja), Ebora (Évora), Olisipo (Lisbon), Scallabis (Santarém), Emerita Augusta (Mérida), Conimbriga (Coimbra), Portucale (Oporto), Bracara Augusta (Braga), and Lima (Ponte de Lima). The Romans also established schools and imposed Latin as the legal and administrative language. Latin came on top of the local Celtiberian or Lusitanian languages, which ultimately resulted in the emergence of Catalan, Castilian, Asturian (Bable), Gallego, Portuguese… (Júdice Gamito 2005; Viegas 2022). Over time, native people climbed the Roman social ladder, sometimes to the very top: Trajan (r. 98–117), Hadrian (r. 117–138), and Theodosius I (r. 379–395) were born in Iberia.

Under Augustus (r. 27 BCE–14 CE), the Peninsula was divided into *Tarraconensis* (capital: *Colonia Tarraco*, Tarragona), *Baetica* (capital: *Corduba*, Córdoba), and *Lusitania* (capital: *Emerita Augusta*, Mérida) (Viegas 2022). Tarraconensis included more than half of Iberia (the north-east). It produced oil, cereals, and wine. Baetica, roughly today's Andalusia, had mining, grain, olive oil, wine, salted and dried fish, and garum. Lusitania, south of the Douro, was much of today's Portugal and Extremadura. It also had mining, grain, fish products, olive oil, wine, etc. Almost everything was produced in excess of local needs: the roman armies were large consumers, and the rest was exported to Rome. In larger cities, archaeologists also found evidence of imported goods from Gaul, the Italian Peninsula, North Africa, and the Near East (Viegas 2022).

In Phoenician times, wine production was small (Carvalho 2021). No evidence of wine in the north-west of the Peninsula exists. The Greek historian Polybius (c. 200–118 BCE) wrote that when the Romans first arrived, wine was produced in Lusitania on a small scale. The Greek geographer Strabo (63 BCE –24 CE) mentioned vineyards at the mouth of the Tagus and noted that people in the Iberian north-west 'drank beer since they didn't have wine' (Carvalho 2021). The Lusitanians started drinking wine only after the Roman conquest (Silva 2011). During the Punic, Celtiberian, and Lusitanian wars, the wine production and trade were minimal (Harutyunyan and Malfeito-Ferreira 2022). After the wars, viticulture exploded throughout Iberia (Peña Cervantes 2020). In the first century CE, the dominant wines

in Lusitania were imports from Baetica. Later, only local wines were consumed (Carvalho 2021). The Romans were wine drinkers (Fleming 2001) and their armies were thirsty. Viniculture became a commercial enterprise, but the cultivation of vines and olive trees as well as the making of wine and olive oil were restricted to Roman citizens. Because of the high transportation costs, only the best wines produced on the Atlantic coast were exported to Rome (Silva 2011).

Wealthy romans built large *villae*, farm estates producing grain, olive oil, and wines (Viegas 2022). The remains of well over a hundred of them have been found south of the Tagus, but only a few have been excavated and studied (San Cucufate, Torre de Palma, Milreu, and so on). Dolia, amphorae, oil or wine presses were often manufactured on site (Larrazabal Galarza and Peña Cervantes 2021). It can be difficult to distinguish between ancient oil and wine presses (Brun 1997, 2020), but the chemical analysis of residue (often in clay jars) provides proof of wine. Some 74 archaeological sites with evidence of winemaking throughout Lusitania have been reported (Martin i Oliveras *et al*. 2021). In the Douro valley, red wine was produced at Fonte do Milho (east of today's Peso da Régua, Peña Cervantes 2020). It is the earliest evidence of winemaking in that region. The ruins of a large number of villae are being found along the Douro river (Pereira 2023a). Most have yet to be excavated.

The Romans brought with them their favourite cultivars and knowledge of viticulture. Much of that knowledge came from the Carthaginian Mago whose 26 volumes on agriculture, including viticulture, were salvaged by the Romans during the destruction of Carthage in 146 BCE. The volumes, now lost, were translated into Latin and Greek and then cited by Roman authors such as Varro (116–27 BCE), Columella (4–70 CE), Pliny the Elder (23–79 CE), and Gargilius Martialis (third century). The Romans also introduced their technology. Wine presses, especially the screw press, were more efficient than the commonly-used foot-treading in stone lagars.

Roman oenological practices included the addition of boiled must or raisins to weaker wines. This increases the sugar content and induces a new fermentation which increases the level of alcohol in the wine. They also added a variety of herbs to flavour the wine and/or mask unwanted flavours. They fined the wine with egg whites, cow blood, or other glues. Some of these techniques were refined or improved in Medieval times. Some are still being used today, such as fermentation and maturation in large clay jars (below).

The elite drunk lightly-coloured ('white') wines obtained from short macerations followed by filtering to remove stalks and skins. The must was then poured into amphorae (later: barrels) to finish the fermentation. Such wines were often flavoured with various herbs and/or sweetened with the addition of raisins or boiled must. Long macerations (a couple of weeks) of red grapes produced dark-coloured ('red') wines. But these were rougher, more tannic, and only consumed by the lower classes (Loureiro 2009). Water was then added to the leftovers of the wine press. That blend was left to ferment as much as it could (a few percent alcohol per volume) and fed to soldiers and slaves. This is how the French later made their (in)famous 'piquette' for the soldiers of the First World War (Estreicher 2023).

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In 92 CE, Domitian banned the planting of new vineyards in Italy and ordered the removal of half the vines in the provinces. Some of the worst vineyards in Lusitania were uprooted, and the overall quality of the wine probably increased (Page 2002). Domitian's edict survived until 280, when Probus allowed all free men in the provinces to own vineyards and make wine. The area under vines increased considerably. In the second and third centuries, the traditional clay amphorae were gradually replaced by wineskins, wooden barrels (Twede 2005), and small flat-bottom jars.

Christianity arrived in Lusitanian cities in the middle of the third century (Page 2002), and then slowly reached the countryside. The country people were called *paganos* ('peasants') but the word came to mean 'pagan' as they were often not Christianized. In the fourth century, Christianity was tolerated together with other religions, and then became the official religion of the empire (Kulikowski 2016). Large cities had bishops with religious and secular authority, which they maintained for a long time.

Around 300 CE, Diocletian carved the provinces of *Gallaecia* (the least Romanized region, capital: Braga) and *Cartaginensis* (capital: Cartagena) out of Tarraconensis. The Peninsula now had five provinces. The Balearic islands were the sixth and Mauritania (across from Gibraltar in North Africa) the seventh. These provinces formed one 'diocese' ruled by a *vicarius* in Mérida (Livermore 1971). He managed the collection of taxes. The level of bureaucracy substantially increased (Carvalho P.C. 2022a).

By the fourth century, Rome's decline was well under way. The army was involved in frequent wars, and the men had to be paid, equipped, and fed. In Rome, the government was hungry for resources. The heavily-taxed provinces were expected to produce the needed goods (Cunliffe 2008). In order to evade excessive taxation, people revolted or migrated away from cities. 'Barbarian' incursions into the empire increased in frequency. Those crossing the Rhine consisted of confederations of tribes: the Alemanni ('all people', Lebecq 1997), Vandals ('wandal' means wanderer, Jones 2006), Franks, and so on. It was only a matter of time before Rome had to abandon its distant provinces and move its troops closer to home (several enclaves in eastern Iberia remained under Byzantine control for some time). For the local populations, this meant catastrophic disruptions in trade and social structure, as well as the collapse of the rule of law. In cities, the bishops assumed secular authority. The days of a long-distance wine trade were over, especially on the Atlantic side of Iberia: Rome no longer needed to supply troops in northern France and England. Wine shipments to England would eventually resume, but eight centuries later.

Alans, Vandals, Suebi and Visigoths

After roaming around Gaul for several years, the Alans (of Iranian origin, Collins 2004), Hastingi Vandals, Silingi Vandals, and Suebi (Germanic tribes) crossed the Pyrenees into Iberia in 409, probably with Roman consent (Livermore 1971;

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Carvalho P.C. 2022b). Their numbers were small compared with the local populations, but the remaining Roman armies were in north-eastern Iberia. Elsewhere, resistance was at best limited and disorganized.

The Suebi and (Hastingi) Vandals settled in today's Galicia and northern Portugal; the Alans occupied a slice of territory extending from southern Portugal to the Mediterranean; the (Silingi) Vandals went to Baetica: Vandalusia, 'land of the Vandals', is a possible origin of the Arab 'Al-Andalus', later Andalusia. Even though the Vandals were long gone by the time the Muslim arrived, the name could have stuck. The invading tribes were cruel to the defenceless local populations but did not destroy vineyards and winemaking hardware: they often protected them (Phillips 2002). Viticulture survived the invasions.

All these tribes were Arian, and thus heretics in the eyes of Catholic bishops. Arians denied the concept of Trinity: being the son of God, Jesus could not be co-eternal or co-substantial with his father. On the other hand, since the first council of Nicaea in 325, the Catholics believed in a Trinity of equals: Father, Son, and Holy Spirit. This divergence created tensions from the start between the invading tribes, the local population, and the existing power structure: the bishops. These invaders did not stay long enough in Iberia to have a major impact on the history of wine. But *lóbio* is a word of Suebi origin (Livermore 1971) related to vineyards. The *Real Academia Galega* defines 'lóbio' as *emparrado de pouca altura*, a vine-driving mode common in Galicia and Minho: the branches of the vines extend high above ground to allow the passage of people or use of the land underneath for other crops[a] (Pereira 2023a).

After sacking Rome, the Visigoths were settled in south-western Gaul by Honorius, in return for military service. King Wallia (r. 415–419) was soon asked to go to Iberia and eliminate the invaders (Collins 2004; Carvalho A.F. 2022). His expedition in 417/8 left only the Suebi in the north-west and a few Vandals in the south. The latter moved to North Africa[b] by 429, while the Suebi expanded their territory to include most of Portugal. This was another period of looting and general misery among the local populations (Carvalho P.C. 2022b). But the Suebi converted to Catholicism in 550, which smoothed their relations with the Catholic bishops and restored some degree of law and order. But the days of the Suebi kingdom were also numbered.

The Visigoths, crushed by the Franks at Vouillé (near Poitiers) in 507, permanently left Gaul and moved across the Pyrenees. Like most Germanic tribes, they were Arians and therefore a religious minority in Iberia. The larger cities, all along the coasts, were ruled by Catholic bishops. This is the likely reason why the Visigoths selected the small city of Toledo as their capital, far away from the coast (Fabião 2022b). The rituals of Visigoth royal inauguration always had to be carried out in Toledo in order for a new king to be legitimized (Collins 2010). The Visigoth King Leovigild took Córdoba from the Byzantines in 572 and conquered the Suebi territory in 585. He is considered to be the founder of the Visigoth 'empire' of Toledo. His son Reccared converted to Catholicism in 589. Soon, the Visigoth tolerance for religious minorities was greatly reduced.

By then, the 'dark ages' had descended upon Europe. The Roman infrastructure was falling apart everywhere, travel was dangerous, most people remained in the countryside where they lived in small towns or villages. Long-range trade was rare, and the production of goods – including wine – limited by the local demand. In 625, the Byzantines were expelled from their last stronghold, Cartagena (Fabião 2022b). All of Iberia was now under one centralized authority, except for the mountainous Basque region.

The Visigoth administration used Latin as its common language. In larger cities, the bishops remained in charge of the local administration. They used Latin as well. Councils met with the King in Toledo, where religious and secular matters were discussed. The high-ranking Visigoths were *comes* ('count' – companion to the king), or *dux* ('duke' – in charge of a regional military force). But the highest rank was *comes scanciarum et dux* (Livermore 1971), someone trusted enough to be the 'wine-pourer' or 'butler' to the King, who often feared poisoning. The Gothic *sciancja* became the Spanish *escanciador* (butler) and the Portuguese *escanção* (sommelier).

The succession of kings involved infighting and sometimes violent disagreements among the nobility. This was particularly true after the death of Witiza in 710: his successor Roderic – the last King of Visigoth Iberia – was strongly contested. In the spring of 711, he moved north against the Basques. This is where he learned of a large Berber invasion in the south. He hurried there.

Islamic Iberia and Christian kingdoms

The Islamic Conquest of Iberia

Following the death of Muhammad in 632, Islam spread rapidly through conquests fuelled by intense religious fervour (Kennedy 2007). By 641, the Arab armies had conquered (today's) Syria, Palestine, Egypt, and Iraq. In 661, the new (Umayyad) caliphate established itself in Damascus. The strip of North Africa from Egypt to the Atlantic was Muslim by 700. Its governor, Musa ibn Nusayr completed the conquest of North Africa, the Balearic Islands, and Sardinia.

In 711, Musa's freedman Ṭāriq ibn Ziyād led some 7000 soldiers (mostly Berbers and some Arabs) into southern Spain, a much larger army than in his earlier exploratory incursions into that region. He consolidated his troops at *Jabal Ṭāriq*, the mountain (or rock) of Ṭāriq, now Gibraltar. Roderic rushed from northern Iberia to meet the new threat. The armies met at Guadalete. The Visigoths were soundly defeated, Roderic was probably killed, and . . . that was pretty much it. Apart from limited resistance by a few cities, the Iberian Peninsula was wide open to the newcomers. Nearly eight centuries of Islamic Iberia were beginning (Livermore 1971; Collins 1998, 2010).

Ṭāriq split his army, took Córdoba and Toledo. Musa was furious: his commander was supposed to lead a scouting expedition, not become a conqueror. That conqueror was to be him (and the loot his). He rushed into Spain with a large

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Arab army and moved north. Ṭāriq and Musa were soon recalled to Damascus and disappeared from history books.

Zaragoza was sacked in 714 and Narbonne in 720 (Collins 2010). An army reached deep into Gaul before being stopped by the Franks near Poitiers in 732. Muslim forces remained in the south of Gaul for another decade before permanently retreating south of the Pyrenees. Roman Iberia had become Al-Andalus; the Baetis river, the Guadalquivir (*wādī l-kabīr*: 'big river'); the south-west, Algarve (*al-ḡarb*: 'the west').

But not all the Visigoths had disappeared. Around 718, Pelagius, possibly of Visigoth royal line, fled to the Cantabrian mountains, where he was elected to succeed Roderic by the remnants of the Visigoth nobility. Pelagius defeated a Berber army, a battle ignored by the Arab governor in Córdoba. The first capital of the kingdom was Cangas de Onis. It moved to Santianes de Pravia in 774 and Oviedo in 791. The Reconquista and the kingdom of Portugal later emerged from this rebellious kingdom of Asturias. The Muslims armies should have carried their conquest to that part of the Peninsula, but they considered it to be a low priority. There was nowhere to go from the extreme north of Spain: it faced the Atlantic. Further, the Arabs preferred to fight in plains: mountain ranges often marked the edge of their conquests (Collins 1998). The Berbers, used to the mountains of North Africa, were stationed in Galicia and the Pyrenees. However, they were treated as inferiors by the Arabs. Serious Berber rebellions occurred in 731–732 and 739–740, after which the Berber garrisons in Galicia disappeared, allowing the Christian kingdom to expand (Collins 2010).

For four decades, the Umayyad Calif in Damascus appointed the Emir of Ifrikiya (North Africa) who, in turn, appointed the Emir of Al-Andalus in Córdoba. Successive Emirs of Al-Andalus felt quite independent of the Calif who was far away and had other pressing issues. They enriched themselves without much supervision. Most of the taxes they raised ended up in their personal coffers, with a cut for their immediate supervisor in Ifrikiya. Their influence was strong in Andalusia, Portugal, central and coastal Spain, but not in Galicia, the northern coast, the Basque region, or the north-west where the Franks were present. The 'frontier towns' were Zaragoza, Toledo, and Mérida.

In 750, the leadership of Islam changed. The Umayyads were slaughtered by the Abbasids who seized the caliphate and moved its capital to Baghdad. The Umayyad Abd al-Rahman, grandson of Caliph Hisham ibn Abd al-Malik, escaped the massacre. He made his way to Al-Andalus where he toppled the governor Yusuf al-Fihri in 756. It took him nearly 20 years to impose his authority throughout Al-Andalus. Abd al-Rahman reigned as an Umayyad Emir (767–788). The Abbasid Caliphs never controlled Iberia. But the kingdom of Asturias took advantage of this period of instability and grew.

Abd al-Rahman's successor, Hisham I, consolidated power, moved against the kingdom in Asturias (Livermore 1971), and sacked Oviedo in 794. He planned a second invasion but died in 796. As a result of these threats, many small fortresses were built from Cantabria to the Duero. That region became Castile, the land of

castles. As the kingdom expanded southward, Asturias faded into obscurity while Galicia, León, and Castile gained importance. In 798, Alfonso II raided the Atlantic coast as far south as Lisbon (Collins 2010), but al-Hakam I (796–822) promptly recovered that territory.

A hymn dedicated to Mauregatus of Asturias (r. 783–788) refers to the legendary evangelization of Iberia by St. James (Livermore 1971). His tomb is said to have been found in Padrón by Pelagius the Hermit in 814, and then brought to the shrine of Compostela. St. James was later credited for helping the army of León against the Muslims at the mythical battle of Clavijo in 842, as well as at Ourique in 1139 (Martinez-Gros 2014). Thus, St. James was one of the most-resilient saints in the Catholic calendar, since he was actually beheaded in Jerusalem under Herod Agrippa in 44 CE (Page 2002). Pilgrimages to the shrine at Santiago de Compostela[c] started in the nineth century and continue to this day: many still walk the Camino(s) every year.

Starting in the early nineth century, the power of the emirate in Cordoba slowly eroded because of rebellions and the emergence of powerful local lords. This allowed the Kings of Asturias to gain more territory (Collins 2010): Ordoño I (r. 850–866) extended the kingdom to the Minho, and then the Douro. Alfonso III 'the Great' (866–910) occupied Porto and Coimbra. He moved the capital to León. His son Ordoño II (r. 914–924) united Léon and Galicia. The Christian kingdom now extended from Coimbra to the Basque region, some 20% of Iberia.

In Córdoba, the fair-skinned and blue-eyed Abd al-Rahman III (r. 912–961) restored Umayyad authority over much of Al-Andalus, and proclaimed himself Caliph in 921. His caliphate survived until 1031. Córdoba became a centre of learning rivalling Baghdad. Córdoba housed the largest library in the world. One of the numerous scholars who thrived there, Al-Zahrawi (Albucassis, 936–1031), was the first to systematically distil grape wine and produce ethanol (Plouvier 2008).

Abd al-Rahman's son, Al-Hakam II became the second Caliph, but at his death in 976, his own son Hisham II was only ten years old. Vizier Al-Mansur took charge. He attacked the Christian kingdoms in the north, without success. This led to a civil war, mostly pitting Arabs against Berbers. In 1031, the caliphate broke up into three dozen small kingdoms, the *taifas*. The more powerful of them were centred in Seville, Badajoz, Zaragoza, and Catalonia. They soon fought each other for supremacy, sometimes forming alliances with Christian leaders in León, Castile, or Aragon. In 1085, the taifa of Seville asked the Almoravids for help in 1085. They were a fundamentalist Berber dynasty centred in Marrakesh. They moved into Al Andalus and took over the taifas. They were appalled to see Jews, Christians, and Muslims coexist, and even consume wine! Tolerance of Christianity, Judaism, and wine quickly disappeared. Saragossa fell to Ramiro of Aragon in 1118. The Almoravids were overtaken by the Almohads in 1145, another fanatic force from north Africa.

On the Christian side, Pope Alexander II began the push for the Reconquista in 1060. Fernando I (r. 1037–1065) formed the kingdom of León-Castile.[d] His son Alfonso VI, King of León (r. 1065–1109), Galicia (r. 1071–1109), and Castile

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(r. 1072–1109) conquered Toledo in 1085 but was defeated by the Almoravids. In the west, he pushed the Christian border south to the Tagus.

The Birth of Portugal

Alfonso VI appealed to French knights in his war against the Muslims. Among those who came were Raymond and Henry of Burgundy. They were related to his late wife (Livermore 1971; Collins 1998; Hatton 2020). Raymond married Alfonso's legitimate daughter Urraca in 1090, became Count of Galicia, and had a son, Alfonso Raymundez. Henry married Alfonso's illegitimate daughter Teresa in 1094, became Count of Portucale, and had a son, Afonso Henriques. At the time, the County of Portucale was just the thin slice of land between the Minho and the Douro. The border between Portugal (south of the Minho) and Galicia (north of it) still exists today.

Raymond died in 1107. Alfonso Raymundez inherited Galicia in 1111. At the death of Alfonso VII in 1126, he also became the King of León-Castile. This is why Galicia remained attached to that kingdom. Henry died in 1112. Teresa ruled Portucale with her lover, the Galician Fernando Pérez de Traba. This relationship made her very unpopular with the clergy and nobility of Portucale. These nobles and the young Afonso Henriques defeated Teresa and Traba at the battle of São Mamede in 1128. Afonso became Count of Portucale, and decided to enlarge his county. He was unsuccessful in the north (Galicia) but very successful in the south by conquering land under Islamic rule. In 1139, he defeated the Almoravids at Ourique, and his soldiers proclaimed him King. He renounced the suzerainty of León-Castile and became Afonso I (r. 1139–1185), the first Burgundian King of Portugal. His capital was Coimbra.

However, his cousin Alfonso VII of Galicia-León-Castile considered Portucale to be a county within his kingdom. Tempers flared. The Pope intervened: wasn't it more important for Christian Kings to fight the Muslims, not each other? Alfonso VII reluctantly recognized the independence of Portugal in Zamora in 1143, but proclaimed himself Emperor, thus superior to a King. Afonso made a deal with the papal representative: he would become the vassal of the Pope (with an annual tribute of 4 ounces of gold), not of the Emperor (Oliveira and Vasconcelos e Sousa 2022). The tensions between Portugal and Castile were just beginning.

Numerous monastic military orders were present in the region. Henry's wife Teresa was the first to invite them to Portugal (Oliveira and Vasconcelos e Sousa 2022). In 1112, she gave to the Hospitallers the Benedictine monastery of Leça. They later established a commandery in Aboim. They had Houses in Coimbra and Lisbon in the late twelfth century, and became militarily active in the Portuguese Reconquista. In 1128, Teresa gave the castle of Soure and its territory to the Templars knights. They established several communities north of the Tagus and were instrumental in the conquest of Santarém. They were renamed the Order of Christ after the suppression of their order in 1319. The monks of the (Spanish) Order of

Santiago arrived in Portugal in 1172. They were active in the conquest of the south, and then settled in Sétubal. The Portuguese Militia of Évora (later: Avis) received a Master from Afonso I in 1176. The orders of Évora and Christ were closely associated with the Kings of Portugal. They later fought the Moors in North Africa.

Having defeated the Muslims at Ourique, Afonso's next conquests were Santarém and Lisbon. Bradford (1983) recounted these events as told in the Chronicle of the English-Norman priest Osbern: English, Flemish, and German crusaders were on their way from northern Europe within the second Crusade. They arrived in Porto in June 1147, and were offered 'good cheap wine' by the local bishop. It must have been good enough or the crusaders thirsty enough: he convinced them to help take Lisbon from the infidels. They sailed south to the Tagus where Afonso I offered them the spoils of the city in exchange for their help. There was a slaughter and considerable looting, but Lisbon became Portuguese. One of the English crusaders, Gilbert of Hastings, became the first bishop of Lisbon. The origin of the close links between Portugal and England dates back to that period (Freeman 1997).

The relations between Portugal and Castile continuously fluctuated from friendly to hostile (Palenzuela 2003). Portugal had emerged from a county that was originally a part of the kingdom of León-Castile, which had yet to fully accept its independence. Both kingdoms were fighting together against Islamic forces in the Peninsula. But successful fighting led to the acquisition of new land, and how to divide that land and draw the boundaries became a source of conflicts. Yet, several Portuguese Kings had Castilian wives (Manuel I had three in succession) and at least seven Castilian Kings had Portuguese wives. This did not prevent conflicts. In 1165, Fernando II married Urraca, daughter of Afonso I. Four years later, Afonso besieged Badajoz which was defended by the same Fernando, this time allied with the Almohads (Sottomayor-Pizarro 2022). Afonso was seriously injured and taken prisoner there. But two years later, the same Fernando helped Afonso against the same Almohads who had attacked Santarém.

In 1179, Pope Alexander III confirmed Afonso's (and his descendants) rights to the throne of Portugal. Afonso died in 1185, having created the kingdom of Portugal and extended its border from the Douro to the Tagus. He also made sure that the conquered land was productive, and in Christian hands.

The Reconquista of the south of Portugal involved much fighting by his son Sancho I, grandson Afonso II, great grandson Sancho II, and his brother Afonso III. The last Muslim stronghold at Faro fell in 1249. Portugal, as we know it today, was complete. Issues associated with the ownership of Algarve were resolved at the Treaty of Badajoz in 1267. The final borders between Portugal and Castile were fixed by Denis of Portugal and Fernando IV of Castile at the Treaty of Alcañices in 1297. These borders are almost the same today.

The Spanish Reconquista ended much later. Sancho VIII of Navarre, Alfonso VIII of Castile, Afonso II of Portugal, and Peter II of Aragon defeated the Almohads in 1212 at the critical battle of Las Navas de Tolosa. The Almohads left Iberia in 1238. Various Christian Kings took Majorca (1230), Valencia (1238), Córdoba

(1236), Sevilla (1248), Jerez (1264), and Murcia (1266). The Muslims were left with the Nasrid emirate of Granada (1238–1492). The Black Plague considerably delayed the end of the Reconquista. Finally, Grenada fell to Ferdinand of Aragon and Isabelle of Castile in 1492.

Wine in Islamic Iberia

Except under the fundamentalist Almoravids (1085–1145) and Almohads (1147–1238), the Muslim attitude toward wine was not hostile. Seven verses of the Qur'an discuss wine (Pickthall 1999). Only two of them (Surah 5.90 and 5.91) strictly forbid wine and associate drinking with Satan. Four verses (Surah 2.219, 4.43, 16.67, and 83.25) are much more nuanced, or only condemn excessive drinking. And then, Surah 47.15 describes four rivers in the gardens of paradise 'where those who fulfill their duties to Allah' are rewarded: in the first river flows unpolluted water; in the second, milk which does not turn sour; in the third, 'wine delicious to the drinker'; and in the fourth, honey. It is unclear how a Satanic drink became a reward in paradise. Fundamentalists (then and today) only remember Surah 5.90 and 5.91. Can the other verses be ignored? The Abbasid Caliph Al-Mahdi (775–785) enjoyed down-to-earth pleasures, as shown in his poems (Glubb 1969)

My good fortune I pray my God may prolong,
Through Abu Hafs, the friend of my leisure.
For the joy of my life is in wine and in song,
Perfumed slave girls and music and pleasure.

Arab and Persian poets often included wine in their verses, such as Omar Khayyám (1048–1122): 'While you live, drink! For once dead, you shall never return. Or: Drink wine. This is life eternal. This is all that youth will give you. It is the season for wine, roses, and drunken friends.'

In Islamic Iberia, moderate drinking was tolerated, but public intoxication was punished by prison until sober followed by public whipping. Only non-Muslims were allowed to produce wine, and precious little (if any) of it was exported. But everybody was fond of *nabibi*, a raisin-based sweet wine. The Arabs also cooked *sikbaj* ('sik': vinegar and 'bāj': stew). Its descendant is today's *escabeche*: fish or meat marinated and cooked in (grape) vinegar. When Almanzor, vizier of al-Hakam II, ordered the uprooting of vineyards near Jerez, the winegrowers argued that they produced raisins for the troops going to jihad: only about one-third of the vineyards were uprooted. In 1147, on their way to the siege of Lisbon, the crusaders reported that wine and vineyards were abundant in the countryside along the Tagus (Stanisławski 1970; Freeman 1997).

Christians and Jews were subject to a special tax called *jizya*. In return, they received autonomy in practising their religion. One annual tax bill was (Collins 1998): 1 dinar, 4 measures of wheat, 4 of barley, 4 jugs of grape juice, 4 of vinegar, 2 of honey, and 2 of oil. But fresh grape juice will ferment and become wine unless it is boiled first to kill the yeast. No such heat treatment was mentioned.

Monastic Wines

As Afonso Henriques moved south of the Douro toward Coimbra and Lisbon, the land he was conquering had to be managed, cultivated, and defended by solidly Christian hands. One option was to give land to his best fighters. An even better one was to used monastic orders. Afonso appealed to his uncle Bernard (later: St. Bernard), the Abbot of the Cistercian abbey of Clairvaux in Burgundy. He was not just any Abbot: Bernard was the most powerful monastic figure of his time, maybe of any time, with influence over Kings and Popes. Bernard sent teams of monks to establish a Cistercian presence in Portugal, under Clairvaux. Such teams usually consisted of a leader and 12 monks, in memory of the 12 Apostoles. It is likely that they brought with them cuttings of French cultivars. Indeed, some Portuguese grapes are descendent of the French Savagnin (Cunha *et al*. 2020). Bernard himself was extremely ascetic. In *De Potatione* (IX, 21), he instructed his monks to consume weak wines, thus avoiding the pleasures associated with strong ones. How strictly his instructions were obeyed by monks living far away from Clairvaux is anyone's guess.

The Cistercians were very successful in Portugal. Over time, they established 16 abbeys and 12 nunneries, most of them north of the Tagus. This started with São João de Tarouca (est. 1143), which generated several daughter-abbeys. But Santa Maria de Alcobaça (est. 1153) became the most important Cistercian abbey in the country (Martins 1998, 2017). Its *couto* (land donated by the King) grew to 440 km^2! In 1559, Pius V elevated the Portuguese Cistercian monasteries to the level of 'Congregation' under Alcobaça, making them independent of Clairvaux. The monasteries kept their *coutos* until the dissolution of all religious orders in 1834. Then, the Cistercians left Portugal.

The Cistercian abbots protected the farmers who worked the land. In return, the farmers paid rent to the abbey, often in must or wine (Loureiro 2020). They also paid to use the monastic wine press. The abbeys had cattle, horses, sheep, goats, vineyards, and produced grain. They built infrastructure and defended the territory during and after the Reconquista (Martins 2017). Some abbeys were also involved in mining, smelting, sometimes ship building, fishing, and even glass blowing.

The Cistercians of Clairvaux were not the only monastic presence in Portugal. According to tradition, the monastery of Lorvão near Coimbra was founded in the sixth century,[e] but the earliest documentation dates to the nineth century. In 1064, it became a Benedictine monastery (under Cluny) and, after 1206, a Cistercian nunnery. Military orders had already established themselves in the region by the time the Cistercians arrived. Franciscan and Dominican friars arrived in Portugal in the early thirteenth century. In the late sixteenth century, two Carthusian charterhouses were founded in Évora and Lisbon. The Jesuits arrived after 1540. This adds up to a strong Catholic presence. But the Cistercians contributed the most to the history of wine in Portugal, by far. They used wooden barrels for winemaking, while south of the Tagus, the use of Roman-type clay jars continued. Some winemakers still use

Figure 3. Medieval-type vineyard with pear, almond, and olive trees growing among self-rooted vines in sandy soil which phylloxera does not like. The branches of a mother-vine touch the ground and grow new roots. Over the years, the vineyard becomes a maze of interconnected trunks and branches, making it very difficult to work the vineyard and harvest the grapes. The area shown contains only a handful of vines (photo SKE).

them today. The monks needed wine for mass, business, and thirst. Hilaire Belloc (1870–1953) got it almost right when he wrote:

Wherever the Catholic sun doth shine,
There's laughter and dancing and good red wine.
At least I've always found it so,
Benedicamus Domino.

Indeed, most of the wine consumed in medieval Europe was white, not red. White wine (from white or red grapes) involves short maceration times while red wine typically requires two weeks or so: this length of time is needed for the alcohol to extract colour from the skins. But this also extracts tannins from the skins and pips, making young red wines harsh to drink. Today, red wines are aged (in barrels or bottles), filtered to remove excessive tannins, and/or softened with new oak. Fine filters and bottles did not exist at the time, and wines were not aged: all wines were drunk within months of the harvest, at most one year. Young red wines were strong and harsh, while white wines were crisp and fruity.

Viticulture expanded under the Cistercians (Lourenço and Loureiro 2013). Vineyards were planted around villages, some for the large-scale production of everyday wines, others for high-quality wines. It was common to find almond, olive, apple, and other trees within or around vineyards (Figure 3). The vines grew on their own. Today's nice rows of single-cultivar vines trained along wires did not exist:

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Figure 4. A medieval tinto wine: white wine to which 'tint' (20% red wine) was added for colour (photo SKE).

these appeared in the late nineteenth century, after phylloxera, when vineyards were replanted (see later). But in medieval times, vines were left to grow as they wished. Whenever a branch touched the ground for a while, new roots would grow. Thus, a single vine ended up having multiple trunks spread over a large area, and the ground became a maze of interconnected trunks and branches. Working in such vineyards is very hard, indeed.

The medieval cultivars included Labrusca, Mourisca, Temporã, Castelã, Ferral, Terrantez, Galega, Azal, Arinta, Tinta, etc., some of which are similar to those grown today (Loureiro 2020). Most of the wines produced were white. Yet, sacramental wine represented the blood of Christ (Loureiro and Lourenço 2013), which presumably was red. The trick was to use 'ink' or 'tint' to colour to white wine. The typical ratio of white wine-to-tint was 5-to-1. A vat 80% full of white wine was topped-off with a long-macerated red wine (Figure 4). In fourteenth-century Coimbra, one horse-load of tint was added to two barrels of white. In 1355, a vineyard in Valada was called *tinteiro* (Loureiro 2020). There are still over 20 red cultivars in Portugal with names containing 'Tinta': e.g., Tinta Barroca, Tinto Cão, Tinta Francisca. Today's Portuguese word for red wine is *vinho tinto* (not *vermelho*). The same tradition existed in medieval Spain, and today, red wine is still *vino tinto* (not *rojo*). The medieval 'tinting' technique is still used today in Ourém, where winemaking traditions date back to Cistercian times. Making white and tinted wines has been the norm for centuries: the word stuck.

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Figure 5. Talhas, talha wines, and hospitality at Adega do Mestre Daniel (XXVI-Talhas), Alentejo (photo SKE).

The Cistercians themselves left precious little written information about their wine and viticulture (Loureiro and Lourenço 2013). Information comes from sources such as a codex of the monastery of Guadalupe dated 1520 with the following instructions:

> step on the grapes in the winepress and pour the clear must into [large wooden] vats, but leave some empty space. Later, add 4 or 5 'loads' of [crushed and macerated red] grapes and the wine will be better with a better colour.

Another type of tinted wine, the *petroleiro*, is produced at Vila de Frades in Alentejo, using a recipe from the monastery of São Cucufate: a field blend of 80% white and 20% red grapes. The clusters are destemmed, and ferment together for about a month in clay jars (Roman *dolia*): the *talhas* (Figure 5). This ancient tradition is now in the capable hands of new generations of winemakers.

From the Early English Trade to the Age of Explorations

Background

Portugal was at war with Islamic forces until the fall of Faro in 1249. As new Iberian territory was conquered by various Christian kingdoms, there were continuous border disputes between Castile and Portugal. They occasionally involved invasions and wars. England had friendly relationships with Portugal since the middle of the twelfth century, but its relationships with Castile, a French ally, were often hostile.

The twelfth and thirteenth centuries were good for trade in Europe. This was the peak of the Medieval Warm Epoch, which lasted from 800 to 1300 (Behringer 2015). The harvests were often above average, the population was growing, large cities emerged, the demand for goods increased, trade flourished, silver was available, and the interest rates were low (Childs 1992). Law, medicine, and other basic topics were taught in the first European universities: Bologna (1088), Oxford (1096), Salamanca

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(1134), Paris (1160), Cambridge (1209), etc. The *Estudo Geral*, created in Lisbon in 1290, moved to Coimbra in 1308, was back in Lisbon in 1354, and then returned to Coimbra in 1377. The University of Coimbra is the oldest in Portugal.

The good thirteenth century was followed by a calamitous fourteenth century (Tuchman 1978). It began with the onset of the Little Ice Age (Fagan 2000; Behringer 2015). The Baltic sea froze in 1303–1304 and 1307; the Venice lagoon froze in 1311 and 1323; the vintage in Bordeaux was miserable in 1315; there was a general vintage failure in France in 1316; 1322 was the coldest winter in memory. A famine of biblical proportions hit western Europe. Because of its favourable location south-west of Europe along the Atlantic ocean, Portugal was less affected than France or England. But the Black Death devastated the entire continent. It reached Portugal in the fall of 1348. Within six months, at least one-third of the population had died (Rodrigues 2017). Benedictow (2006) estimated that by the end of the first wave of the plague, nearly 60% of the population of Europe had died. This had huge social consequences. Many properties were abandoned and/or unclaimed. A number of them became church property (Da Cruz Coelho 2022). In much of Europe, this pandemic marked the end of the feudal system. The plague returned in 1361, 1369, 1373–1374, and 1388–1390, albeit with much smaller death rates.

The confiscation of the English duchy of Guyenne by Philipe VI of France triggered the Hundred Years' War (1337–1453) with England, a dynastic struggle about the crown of France. This conflict spilled into the Iberian Peninsula because of dynastic crises in both Castile, a supporter of France, and Portugal, an ally of England (Palenzuela 2003; Gouveia Monteiro 2022).

In 1357, Afonso IV of Portugal was succeeded by his son Pedro I ('the Cruel', r. 1357–1367). He was the uncle of Pedro I of Castile (also 'the Cruel', r. 1350–1369). In 1367, Pedro of Portugal was succeeded by his son Fernando I. Two years later, in Castile, Enrique of Trastámara killed his half-brother Pedro (allegedly, with his own hands) and proclaimed himself Enrique II. But he was illegitimate. Fernando (of Portugal) claimed the throne of Castile as the great-grandson of Sancho IV, while John of Gaunt (Duke of Lancaster and son of Edward III) claimed the same throne through his second wife Constanza, daughter of Pedro of Castile. Now France risked losing Spain – a precious ally – if either claim was successful. Enrique waged inconclusive wars against Portugal, died in 1379, and was succeeded by his son Juan I, also considered illegitimate. And then came another twist of fate, this time on the Portuguese side: in 1383, Fernando died without a male heir. His daughter, Beatriz, was married to Juan I of Castile who promptly claimed the throne of Portugal and invaded the country. The people of Portugal would have none of it: they acclaimed Fernando's half-brother João, Master of the Order of Avis, and illegitimate son of Pedro of Portugal. Confusing?

Portugal turned to England for help. John of Gaunt seized that opportunity and sailed with some 600 longbowmen. The French sent Gascon troops and knights to support their ally, Castile. Juan invaded Portugal and marched on Lisbon. The climax occurred in 1385 at Aljubarrota. A well-organized Portuguese force of about 10,000 men assisted by the English longbowmen promptly routed a much

larger but disorganized Castilian force assisted by French knights. The latter, unwisely, charged against the devastating longbows.[f]

The decisive Portuguese victory at Aljubarrota secured Portugal's independence and João I's claim to the crown of Portugal. He became the first King of the House of Avis and reigned until 1433: a 38-year period of peace and prosperity. In 1386, he and Richard II sealed the Treaty of Windsor. It promised eternal friendship and confirmed the political, military, and commercial alliance between Portugal and England. This treaty has been ratified multiple times and is still in effect today. As for John of Gaunt, his efforts to gain the throne of Castile came to nothing. However, his daughter Philippa of Lancaster married João in Porto in 1387. She kept contact with her brother Henry IV and then her nephew Henry V until her death in 1415, thus reinforcing the ties between the two kingdoms. She also mothered several children, among them Henrique, later nicknamed 'the Navigator' even though the extent of his navigation was limited to being a passenger on two short crossings of the strait of Gibraltar. Philippa's only surviving daughter, Isabella, became duchesse of Burgundy. At the time, it included the economically important Flanders.

By the end of the fourteenth century, Lisbon had become the centre of the kingdom and was a frequent residence of the King. The city was simmering with political, commercial, and ecclesiastic activity. This attracted merchants, dignitaries, and ambassadors from England, Flanders, Italy, and other trading powers (but not France).

The Beginning of the Portuguese Wine Trade

Since its earliest days, the leaders of Portugal were keenly aware of the importance of international trade. Wine was one of the most important commodities. The conquest of Lisbon was achieved with the help of English, French, Flemish, and German crusaders, but the English seem to have developed strong friendships, and trade links followed. Lisbon, which had been an important port in Roman times but much less so under Islamic rule, regained its importance after 1147. At that time, the banks of the Tagus produced most of the wines in the country.

The main shipping routes linked the Mediterranean to England and Flanders – in particular, Bruges, where everything was traded (Childs 1992, 2009). Ships coming from the Mediterranean often stopped in Lisbon. England exported mostly wool, cloth, and minerals. It imported wine, oil, fruits, grain, as well as iron from Spain. In the thirteenth century, England got most of its wines from nearby Rouen in Normandy as well as from the Loire, Anjou, and the Rhine. As for Portugal, its most important trading partners were Flanders and England. It exported olive oil, grain, fruits, honey, salt, sometimes cork and – starting in the middle of the thirteenth century – wine, but at first only in small quantities. That trade grew. The Portuguese wines for export were sometimes strengthened by the addition of raisins (Loureiro 2024). The yeast would feed on the added sugar and increase the alcohol content. These wines travelled better, and sometimes had a little residual sugar as well.

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Portuguese merchants were active in England. King John granted them safe conduct in 1202 (Simon 1906). His son Henry III granted letters of safe conduct for up to 100 merchants from Lisbon and Coimbra (Benham 2022). In 1295, the first shipment of wine from the Entre-Douro-e-Minho region was shipped from Viana do Lima (Viana do Castelo) in the north of Portugal (Loureiro *et al*. 2025). In 1303, Edward I's *Carta Mercatoria* granted merchants from France, Castile, Portugal, Navarre and other countries permission to stay in England and trade as they wished, in exchange for paying taxes (Simon 1906; Childs 2009). In 1341, Edward III imposed a tax of 2 shillings per tun (900-litre barrel) of imported wine, which was then sold at £5 (Simon 1906). In 1352, Edward III granted a one-year letter of safe conduct to Portuguese merchants and ships. That year, 18 Portuguese ships brought 651 tuns of wine to England. This is much less than Castile, which brought over 4300 tuns that year (Childs 1992). The following year, a commercial treaty between Portuguese merchants and Edward III guaranteed the safety of traders. In 1386, two English trading posts were active in Viana and Monção, in the north of Portugal (Loureiro *et al*. 2025).

In the thirteenth and early fourteenth centuries, Portuguese wine was part of a general cargo. The contribution of Portugal to England's wine imports was no more than 5% (Childs 2009). Castile shipped more wine to England than Portugal, while entire fleets of French and Rhenish wine arrived in England. In the fourteenth and fifteenth centuries, Portugal shipped a few hundred tuns of wine per year to England. For comparison, Edward III ordered 1000 tuns of wine from Bordeaux just for his coronation in 1327.

Following the treaty of Windsor, the wine trade between Portugal and England increased: six to ten Portuguese galleys arrived every year in England. Most merchant ships carried about 100 tons of cargo, but that grew to some 300 tons in the fifteenth century. The majority of Portuguese wines came from the Lisbon area. Some were sweetened with raisins, but many were dry: the customs they paid upon arrival in England were for non-sweet wines (Childs 1992). Smaller quantities of wine came from other regions of Portugal: in 1412, Henry IV bought 96 pipes[g] of (probably sweet) wine from Algarve (Simon 1906).

Medieval wines were short-lived. 'New' wines were a few months old – the most recent harvest. 'Deteriorating' wines were over one year old. Aged wines were very rare. The short lifetime was caused by a lack of understanding of the fermentation processes, bad hygiene (e.g. re-using poorly cleaned barrels), absence of precautions to prevent oxidation (ullage), and low alcohol content. Indeed, the harvest was normally done as soon as the grapes were mature for fear that birds or foxes would feed on them, or that poor weather would ruin the crop. As a result, the sugar/acid ratio was often low, leading to unstable wines: maybe 10% alcohol or less. For this reason, wines were not shipped during the summer months as the heat caused them to deteriorate. For example, 'new' Bordeaux wines were shipped in the fall (they arrived in England in time for Christmas) and the 'wines of rack' were shipped in the spring (they arrived by Easter).

The various wines were referred to by the region of production (Gascony, Loire, Rhine, Spain, Algarve, etc.) or the port of origin. The colour was mentioned (white or red) but rarely the grape. Some of the names in customs records were confusing because the English spelling was phonetic and depended on the way one person pronounced a word and another understood it. An unusual name in a foreign language could become something unexpected in the written records. For example, in 1353, the London Guild Hall Letter Books reports the unloading of 109 tuns of 'wine de la Rebasele' arriving from Lisbon (Simon 1906). As spelled, this does not refer to anything known. Some wine was produced at Ribadesella but that is in Asturias and 109 tuns would be an unusually large one-time shipment from that region. Further, it is highly unlikely that a ship would sail from Asturias to London via Lisbon. Manuel Ferreira suggested that 'Rebasele' could simply be a bad spelling for 'Ribatejo'. The banks of the Tagus produced most of the Portuguese wine at the time, and these would arrive from Lisbon.

In thirteenth- to fifteenth-century England, an often-mentioned wine was recorded as 'Osey', 'Osoye', 'Osaye', 'Asoye', 'Aussay', and other variations of the name. Two hundred tuns of it were shipped in 1482 (Simon 1906). Simon (1906) argued that it had to come from Portugal because of the context in which it was mentioned. No Portuguese source mentions that name, but then no local custom record prior to the sixteenth century has survived (Childs 1992). Osey could be a corruption of 'Azóia'. But which one? Two dozen towns or villages in Portugal are called Azóia or include it in their name. Freeman (1997) has reviewed the topic and associated Osey with Santa Iria de Azóia, a small town located a few miles north-east of Lisbon on the north bank of the Tagus. It is very close to the old port of Sacavém. The wines from the region, collected there for shipping, could have been named by the English merchants as coming from Azóia. The association of Osey with Azóia is still being debated (Loureiro 2024). It has been suggested that Osey was a fortified or sweet wine (Rose 2011). Although it is possible that simple alembics were used to distil wine in Portugal as early as the twelfth century, the very small amounts of alcohol produced were for medical use and were probably toxic: distillation produces methanol which must be removed (the 'head', maybe the first 10% or so). The earliest records of wine distillation for human consumption date back to the early sixteenth century. Osey cannot have been a fortified wine. But raisins might have been added, and 'sweet' is possible. However, in 1365, Edward III ordered all sweet wines 'to be arrested' only to clarify a little later that he did not intend that Osey, Algarve, and Spanish wines 'should be reputed sweet' (Simon 1906; Childs 1992). We may never know.

In 1293, King Dinis of Portugal recognized the Merchant Exchange, an organization of merchants and shipowners that acted as an insurance: the members contributed capital to defray the cost of accidents, business expenses (including bribes), and piracy. The latter was a growing problem. No country had a professional navy patrolling the seas to guarantee the safety of merchants' ships. As trade increased along Atlantic routes, so did piracy by Breton, Norman, or English opportunists. As early as 1227 or 1228, Spanish ships were robbed near the English

coast (Childs 1992). Between 1317 and 1321, several Portuguese ships were attacked and their cargo stolen (Simon 1906). In 1338, England offered Royal protection to merchants, including men-of-arms on board merchant ships. Yet, in 1402, several Lisbon merchants complained that their ship was seized at sea with 74 tuns of wine (Simon 1906).

In the early fifteenth century, at the height of the Hundred Years War, the situation became so dire that Henry IV sent an armed fleet to Bordeaux to fetch his wines, and merchants organized shipping in convoys. Yet, ships were still captured, looted, burnt, and the crews sometimes thrown overboard. England reacted by ordering the nobility to provide ships with crew, archers, and armed men to attack pirate ships. As a reward, they could keep the cargo. Big mistake. They soon attacked pirates and merchants alike. In 1403, the merchant ship *La Katerine* sailed from Lisbon with 47 tuns of wine. It was taken in the Channel by Norman pirates, who were themselves attacked by English sailors. But they kept the ship and its cargo as their reward, to the dismay of the Portuguese merchants (Simon 1906).

Upon arrival in England, the wines were charged import duties (Simon 1906) and the King (ab)used a privilege called *recta prisa*: his choice of two tuns of wine from every wine-laden ship arriving at a port where royal officers had been appointed. In 1280, Edward I got himself 238 free tuns of wine (Simon 1906). This rule, the taxes and fees, and the severe restrictions imposed on foreign merchants arriving in London (where and how long they could stay, to whom they could sell, etc.) resulted in smuggling through smaller ports, especially Bristol (Jones 2012). That port had a 'searcher', an official charged with collecting taxes and preventing ships from being loaded or unloaded illegally. But the searcher had to purchase his job from the Lord Treasurer of England, received very low wages, and had to pay his deputies out of pocket to inspect the ships. The solution was to forget to inspect a ship from time to time, or undercount a cargo – for a bribe of course. Some searchers became very wealthy.

The French wine trade with England took a nosedive after the end of the Hundred Years' War in 1453. England entered a tumultuous period known as the Wars of the Roses (1455–1487), during which Edward IV prohibited the import of wine from any French province that had once belonged to England. Wine merchants had to prove that their wine was, say, from Spain or Portugal, and not Bordeaux. This was near-impossible if a ship had made a stop in Bordeaux at any time. As a result, some French wines were shipped to Ireland (Waterford or Cork) and then smuggled to England. Other wines were shipped to Spain or Portugal, decanted into Spanish or Portuguese barrels, and then shipped to England. Portugal also shipped its own wines to England. But Portugal never shipped to France. The Bordeaux constable's account for wine duty lists only one Portuguese ship for the entire fifteenth century (Childs 1992). The best Portuguese wines were shipped to England and Flanders, or consumed by the local elites. These wines sold at prices comparable with those fetched by Spanish or French wines (Simon 1906).

Kingdom, Empire, Union with Spain, and Restoration

Background

In the early fifteenth century, the Renaissance was spreading from Italy, signalling a period of curiosity, invention, and exploration that changed the western world. Spices and luxury goods from the Far East arrived along the silk roads and were then shipped across the Mediterranean by Venetian and Genoese traders. Countless middle-men took a cut of that trade. Gold and slaves travelled across the Sahara to North Africa, benefiting cities such as Cairo or Tunis. Castile and Aragon were busy finishing their Reconquista. England was at war with France (until 1453), and then with itself (Wars of the Roses). Neither the English East-India Company nor the mighty Dutch *Vereinigte Ostindische Compagnie* yet existed: they were established in 1600 and 1602, respectively. France did not have much of a navy until 1624. But the Portuguese explorers were ready in the early 1400s. They sailed along the west coast of Africa, to Atlantic archipelagos, and later to India, the Spice Islands and the Far East, Brazil, and then around South America into the Pacific Ocean. Portugal owned the waves and made a fortune.

The beginning of these explorations was the conquest of Ceuta from the Moors in 1415 (Duarte 2022). The city had been a formidable fortress for centuries but, in the early fifteenth century, it was no longer so. As the considerable Portuguese fleet arrived, the city's inhabitants and most defenders simply fled. Ceuta fell in a few hours. The gain was mostly strategic: with Ceuta under Portuguese control, and then Gibraltar conquered by Spain (in 1462), the entrance to the Mediterranean was in Christian hands and the threat of piracy greatly reduced. A new ship was designed, the caravel (Hatton 2020). With its two triangular sails, it could navigate against the wind in a zig-zag pattern. It was operated by a small crew of 20 to 30 sailors, thus reducing the quantity of food and drinking water required for long journeys. The astrolabe, which used fixed starts as reference points, and the compass allowed deep-sea navigation.

The man behind the early Portuguese explorations was the Infante Dom Henrique (1394–1460) (Russel 2001; Page 2002; Oliveira 2022). He participated in the conquest of Ceuta in 1415. Four years later, he was appointed governor of Algarve, which included the Portuguese possessions in North Africa. In 1426, he became Grand Master of the Order of Christ and used its funds to sponsor explorations. Henrique led the Order in a foolish expedition against Tangier in 1437. He barely escaped with the shirt on his back and left his younger brother Fernando a hostage with a promise to return Ceuta to Muslim control. Ceuta remained Portuguese, Fernando died in captivity, Henrique was to blame.

Henrique organized expeditions along the west coast of Africa in search of gold, ivory, and slaves. The southern limit of such explorations was Cape Bojador – the 'Cape of Fear' – south of which life was thought to be impossible. When Gil Eanes discovered a passable route around Cape Bojador in 1434, life farther south was found to be just fine. The first Portuguese fort was built in 1445 at Arguin (modern Mauritania). But explorations into the gulf of Guinea, much closer to the source of

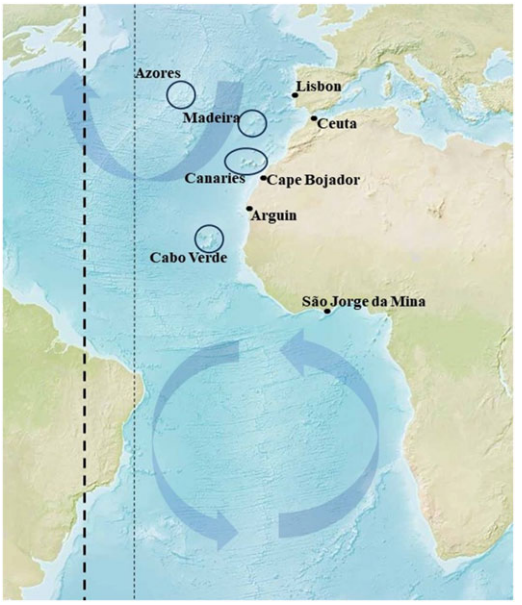

Figure 6. Dominant currents in the Atlantic (darker-blue arrows). Note the strategic location of Madeira, Canaries, and Cabo Verde when sailing south from Lisbon, and the Açores on the way back. The 1493 (thin dash) and 1494 (thick dash) demarcation lines between Spain and Portugal are shown (map SKE).

gold and slaves, were complicated by the counterclockwise currents and winds in the south Atlantic (Figure 6).

In 1441, three important Black captives were brought from Africa to Algarve, and then exchanged for Black slaves. Dom Henrique needed slaves to cultivate the Algarve where malaria was endemic. Soon, more slaves, as well as gold and ivory, arrived by sea from the west coast of Africa: the Portuguese had bypassed the Muslim land-based trade routes across the Sahara. In 1443, the *Casa da Guiné* was founded to regulate and tax that trade. In 1452, Pope Nicholas V's bull *Dum Diversas* granted to the King of Portugal the 'power to attack, conquer and subjugate Saracens, pagans and other unbelievers and enemies of Christ [. . .] and to reduce their persons into perpetual servitude.' This papal blessing of slavery provided a cover for centuries of abuse. The African trade with Portugal quickly exceeded 1000 slaves per year. The Cabo Verde islands were discovered in 1458. Portuguese explorers reached Sierra Leon in 1460, the year Dom Henrique died.

The explorations continued. The fort of São Jorge da Mina was established by João II in 1480. It would become a major African trade hub. In 1488, Bartolomeu Dias reached the Cape of Tempests – soon renamed a more reassuring Cape of Good Hope (Givens 2022). Within a decade, Vasco de Gama sailed along the east coast of Africa, and then across the Indian Ocean to Calicut. The Portuguese reached Ormuz (1509), Goa (1510, their base for Far East explorations), Malacca (1511), and Macau (1513). This sailing was greatly helped by the settlements in Madeira and the Açores.

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Soon, Portuguese interests shifted to India (Subrahmanyam 2014): the *Casa da Guiné* was absorbed into the *Casa da Índia* in 1513. Portugal had settlements in Madeira, Açores, Cabo Verde, São Tomé, Angola, India, Brazil, Indonesia, etc. It traded with Japan and established a base in Nagasaki (1543). Now the Portuguese had bypassed the Silk Roads. These explorations involved 'Greed and God' (Hatton 2020), as summarized by the Jesuit António Vieira: 'preachers take the gospel, traders take the preacher'. Massive amounts of wealth arrived in Lisbon (Givens 2022). Legislation prohibited viticulture in most of the new Portuguese colonies (Simon 1906), which received wines from Portugal, thus providing a lucrative outlet for its lesser-quality wines.

The first competition followed Columbus' 1492 trip across the Atlantic. In May 1493, Pope Alexander VI (the Spaniard Rodrigo Borgia) issued the Bull *Inter Caetera* which divided the new world between Spain and Portugal: the lands discovered and to be discovered west of a line drawn from the north to the south pole passing 'one hundred leagues towards the west and south from [. . .] the Açores and Cape Verde [. . .]' belonged to Spain, and those east of it to Portugal. Even though one hundred leagues was a comfortable 550 km, Portugal quickly argued that the line was too close to the Açores and should be moved another 270 leagues to the west. The 1494 treaty of Tordesillas (Bown 2012) achieved just that. It gave to Portugal a large slice of Brazil (yet officially undiscovered).

This treaty was one of the last acts of João II (1481–1495). He had promoted the exploration of the Atlantic and insisted on absolute secrecy about discoveries and the locations of settlements and forts. João had dealt harshly with Jews fleeing Spain (Green 2007; Bethencourt 2009). A first wave of refugees followed the establishment of the Papal Inquisition in Spain (1478). A much larger wave resulted from the Edict of Expulsion (1492) and the reorganization of the Spanish Inquisition under the feared Dominican Tomás de Torquemada. João granted residence to a few hundred families (for a large fee), while others got transit visas for up to eight months. João imprisoned those who extended their stay.

The future of Portugal looked bright. Lisbon had become very wealthy and attracted dignitaries, merchants, and bankers from much of Europe. Portugal enjoyed a virtual monopoly of the sea trade with Africa, India, and the Far East. Ships kept on arriving, loaded with precious cargoes, of which the King got 20%. The new galleon, much larger than the caravel, had a capacity of 600 tons. Yet, the population of Portugal was at most 1.5 million (Palma and Reis 2019), about one-quarter that of Spain. There were just 3000 to 4000 Portuguese in the entire Indian Ocean, about 90% of them male. Very few settled permanently. The Portuguese also had to deal with local established powers (Subrahmanyam 2014). Portugal's grip on most of its distant colonies was tenuous.

In 1500, a 13-ship expedition to Calicut led by Pedro Álvares Cabral sailed a little too far west into the Atlantic. It encountered the 'Terra de Vera Cruz', soon to be renamed Brazil because of the abundance of the brazilwood – the national tree of Brazil. It has a dense orange-red core, and is used in musical instruments and dyes. Cabral sent one ship back to Lisbon with the official news of the discovery of Brazil,

conveniently past the deadline for revoking the treaty of Tordesillas (Bennassar 2014). The economic potential of Brazil was evaluated by adventurers such as Amerigo Vespucci and Alfonso Gonçalves: besides abundant forests and precious woods, there were few indigenous people to trade with. Thus, for a while, Brazil remained a low priority: Portugal was busy with trade in Africa, India, and the Spice Islands. But this was about to change.

João II died in 1495 and was succeeded by his 26 year-old cousin Manuel I 'the Fortunate' (1495–1521). During his reign, the Portuguese empire reached its greatest extent. Portugal enjoyed a golden age (Hatton 2020) which continued through the first decade of the reign of his son, João III (1521–1557). Manuel had far more wealth than he knew what to do with, resulting in extravagant and wasteful spending. Following Vasco de Gama's 1497–1499 trip to India, Manuel had five elephants brought back: they walked before him as he rode through Lisbon, preceded by a rhinoceros (Gois 1566). He never wore the same clothes twice, and gave tax exemptions to the nobility, severely reducing the country's tax base. In 1520, he established Portuguese as his administration's language, replacing Latin.

Manuel did not have a personal animosity toward Jews and conversos. He freed those imprisoned by João II and encouraged them to convert. But when he sought the hand of Isabella (a daughter of the very Catholic Ferdinand and Isabelle), she agreed but demanded that all the Jews be expelled from Portugal first. That was about 10% of the total population. Manuel played for time. He gave the Jews more than one year reprieve, and ordered them to depart from Lisbon in the fall of 1497. As they assembled to leave, he had them baptized, and gave these unwilling new *conversos* a 20-year amnesty. For him, the problem was solved: technically, there were no more Jews in Portugal. He married Isabella. But the new conversos had everything to fear from the Inquisition (Green 2007; Bethencourt 2009). Further, the 'old' Portuguese Christians were quite sceptical about them. This sparked violent riots in Lisbon (1504) and Évora (1505). The situation of the conversos became a lot worse under João III. In 1536, he implanted the Inquisition in Portugal. Three years later, his brother, Cardinal Henry, became the first Inquisitor General. A flood of accusations against conversos followed. Inquisition prisons overflowed and tribunals were established in Lisbon, Évora, Coimbra, Tomar, Lamego, and Porto. The Inquisition quickly spread to the colonies. Goa, the capital of the Portuguese Viceroy of India, became the seat of the bloodiest Inquisition tribunal.

The Jesuits arrived in Portugal in 1540, the year the Order was created. They established religious schools in Portugal (Coimbra in 1542) and its colonies: Funchal in 1570, Ponta Delgada in 1591, etc. The Jesuits also got involved in government, soon holding important positions at the court. But their true allegiance was to the Pope, not to Portugal or its king.

The wine trade was booming. Portugal exported 600–700 tuns of wine per year to England, and more to Flanders (Childs 1992). In 1539, more than 20 French and English ships were in Lisbon to fetch wine. In 1555, a fleet of 18 Portuguese ships loaded with wine sailed to The Netherlands (Simon 1906). Quality wines were shipped from Lisbon and Setúbal. The robust wines from the Douro valley, known

as 'red-Portuguese', were of poor quality (Bradford 1983). Most low-alcohol red wines from the nearby Vinho Verde region were thin and did not travel well, except for Monção which exported clarets to England.

The Portuguese colonies in Africa, Asia, and the Far East experienced difficulties during the reign of João III (Page 2002; Givens 2022): Portuguese ships were increasingly looted by pirates. And then, formidable competition arrived as the English, French, and Ottomans became eager to get a slice of the pie. The supply of spices increased and the prices collapsed. In Lisbon, the flow of money was drying up. In 1532, João began to withdraw Portuguese garrisons from the Moroccan coast and end, or at least slow down, the expansions in Africa and Asia. Portugal gradually left its possessions in India and Indonesia (Subrahmanyam 2014). The English and Dutch would become the dominant powers there.

In addition, there were dynastic problems at home. João III's only surviving child was the sickly João. In 1552, he was married to Juana Maria, daughter of Charles I of Spain. But the condition was that, should João III and Prince João die without a male heir, the crown of Portugal would merge with the crown of Spain (Givens 2022). Prince João died in 1554, with Juana Maria pregnant. She delivered a son, Sebastião. When João III died in 1553, the future of the Avis dynasty rested on the shoulders of the three-year-old Sebastião. The regency was assumed by his grandmother and then his great-uncle Cardinal Henrique.

Sebastião received an unflinching Catholic upbringing. He assumed power in 1568, surrounded himself with young and inexperienced ministers, and dreamt of a crusade against Islam. In August 1578, he and his army sailed to Morocco. He was warned that the Emir was waiting for him with a substantial force, but ignored that threat. He was advised to stay close to the coast, making it possible to supply his troops or retreat should the need arise. He ignored this as well. Sebastião led his army south into the desert, in August, with little water and few supplies. The battle at Alcácer-Quibir was a disaster. Sebastião disappeared (probably killed), much of his army was killed, captured for ransom, or sold into slavery. In Portugal, Cardinal Henrique assumed the throne but then died on his birthday, January 31, 1580. This marked the end of the Avis dynasty. Philip II of Spain became Felipe I of Portugal (1581–1598): one crown, two administrations. This marks the beginning of an economic decline in Portugal that lasted until the 1640s (Palma and Reis 2019).

Spain gained Portugal, the Portuguese colonies and the income they produced, as well as the deep-water port of Lisbon on the Atlantic. In exchange, Portugal got . . . nothing. Felipe I rarely visited Lisbon. His son Felipe II (1598–1621) and grandson Filipe III (1621–1640) ruled from Madrid. These kings prioritized Spanish wines over Portuguese ones. Portugal's traditional friends became its enemies. The English and Dutch seized some Portuguese strongholds in Asia, Africa, and Brazil. Portuguese ships became fair game for the English navy. The feared Francis Drake attacked Cabo Verde in 1585 and Lisbon in 1587. The Spanish rule was authoritarian, taxes increased, as did demands to participate in Spanish wars. In 1588, a large part of the Great Armada against England sailed from Lisbon (Howarth 2001). This expedition ruined both Spain and Portugal and seriously affected Portuguese naval power.

In 1589, Felipe I ordered the expulsion of all the English merchants residing in Portugal. The wine trade between Portugal and England continued, in secret (Simon 1906) but, after 1597, tensions grew between the Anglican English merchants and the Inquisition (Bradford 1983).

From 1568 to 1648, Spain was at war in the Low Countries, resulting in the seven (Protestant) northern provinces seceding from (Catholic) Hapsburg rule. The Netherlands quickly became a major maritime power and dominated the world trade, including wine. The Dutch became aggressive against Portuguese colonies and temporarily controlled large parts of Brazil. Spain was also involved in the bloody Thirty-Years' war (1618–1648), and in smaller conflicts involving France and England. Wars are expensive. Taxes and inflation increased. And so did the unhappiness in Portugal, resulting in riots against Spanish rule.

In 1640, Spain was at war with France and fighting a rebellion in Catalonia. The Portuguese nobility initiated the revolution that led to the restauration of independence (Hatton 2020). It started with a visit by the Duke of Bragança – a descendent from an illegitimate branch of the house of Avis. He showed little interest in claiming the crown until his wife Luísa famously claimed that she would 'rather be queen for a day than duchess for life'. Yet another strong woman leading a man. Thus started the reign of João IV (1640–1656). The resumption of close economic and military ties with England soon followed. Portugal quickly recovered Angola and São Tomé from the Dutch. The restoration formally ended under the rule of João's son, Afonso VI, with the Treaty of Lisbon (1668) and the recognition by Spain of the House of Bragança.

In the meantime, the importance of Brazil had grown. Its first cash crop was sugar. The first sugar mill (*engenho*) was built in São Vicente in 1532. Production soon took off as nobles, Jesuits, Benedictines, and even conversos got into that lucrative business. By mid-century, more than 20,000 Portuguese had moved to Brazil. There were 60 *engenhos* in 1570, powered by large numbers of African slaves (Bennassar 2014). The peak of 60,000 tons of sugar was produced in 1610. Brazil also shipped tobacco, hides, diamonds, hard wood, and so on. The *Companhia Geral do Comércio do Brazil*, founded in 1649, had a monopoly on all that trade.

The presence of several groups of volcanic islands in the Atlantic greatly facilitated the sailing to and from Africa, Asia, and the Americas. From north to south, they are the Açores, Madeira, Canaries, and Cabo Verde. The dominant currents in the Atlantic (Figure 6) show the strategic importance of the archipelagos for long-haul voyages. Madeira was the first victualling stop for (mostly empty) ships sailing from Portugal. They would then make a brief stop in Cabo Verde before sailing either to Brazil, Africa, or around the Cape to India and the Far East. On the way back, the ships – full of trade goods – often stopped in the Açores before returning to Lisbon.

The Canary islands, sometimes visible from the coast of Morocco, were known since antiquity. Pliny the Elder (23/4–79 CE) wrote that the Carthaginians first explored these islands, which were then forgotten. A Genoese-Portuguese expedition visited them in 1336 (Fernández-Armesto 1987) and in 1345, Ferdinand I of Aragon

claimed to have 'turned the eyes of our mind to the subjugation of the Canary Islands'. Castile and Portugal both claimed them. The issue was resolved in favour of Castile (treaty of Alcáçovas, 1479) but Madeira and the Açores became Portuguese.

The Madeira archipelago (four islands) is some 1000 km off Europe. When the Portuguese first arrived in 1419 (Candido 2022), Madeira was uninhabited and covered with forests, hence the name (in Portuguese, *madeira* means wood). The Açores (Azores, nine uninhabited islands) located 1600 km off Europe, were first spotted in 1427. Both archipelagos were colonized in the summer of 1439 under Dom Henrique (Fernández-Armesto 1987). They became famous for their wines. Cabo Verde, discovered in 1458, attracted far fewer Europeans. It played a role in the transatlantic slave trade and produced sugar, cotton, salt and fish.

Madeira

The colonization involved captaincies (*donatarias*) subordinate to Dom Henrique. This system encouraged wealthy nobles to invest in the islands (Fernández-Armesto 1987; Vieira 1996). The captains gave grants of land (*sesmerias*) to settlers provided that they developed it for a specified length of time, typically five years, after which the land was theirs. They exported products to Portugal without paying duties. The tenants who worked the land often received as much as half the crops. The captains had a monopoly on flour mills, bread ovens, salt, and mining. They also had jurisdiction, but serious cases could be appealed to the Infante. After 1501, land could be purchased, rented, or inherited.

The first captains were João Gonçalves Zarco (in Funchal), Tristão Vaz Teixeira (in Machico), and Bartolomeu Perestrello (in Porto Santo). The settlers brought with them wheat, vine cuttings, fruit and vegetable seeds, sugar canes, sheep, and so on. Slaves were imported to do the hard work (Vieira 1996; Candido 2022). The first ones were Guanches from the Canaries, Muslims from North Africa, and Blacks from sub-Saharan Africa. Criminals and other undesirables were also exiled to Madeira. The early years were turbulent.

But forests were burnt and land was cleared to make room for crops. The first terraces (to retain rainwater) and *levadas* (to provide irrigation and drinking water) were built (Figure 7). The levadas are 0.5 to 0.6 m-wide water channels carved into the side of the mountains with a gentle slope (0.5 to 1%). The first ones, on the south side of the island, were financed by the Genoese and served to irrigate sugar canes.

The crops performed extremely well in the rich soil and sub-tropical climate of Madeira, especially the grapevine and sugar cane. Until the middle of the fifteenth century, sugar was a rare and expensive luxury (Galloway 1977; Valkanou 2020). The limited medieval production was controlled by the Genoese (in Cyprus), Venetians (in Crete), and later Spaniards (in Sicily). Dom Henrique acquired cane plants and hired experienced sugar workers from Sicily, and sent them to Madeira. The first sugar mill was operational in 1452 and, by 1460, Madeira had become the largest sugar producer in the world. Madeira also exported grain, wine, and timber – mostly to Portugal.

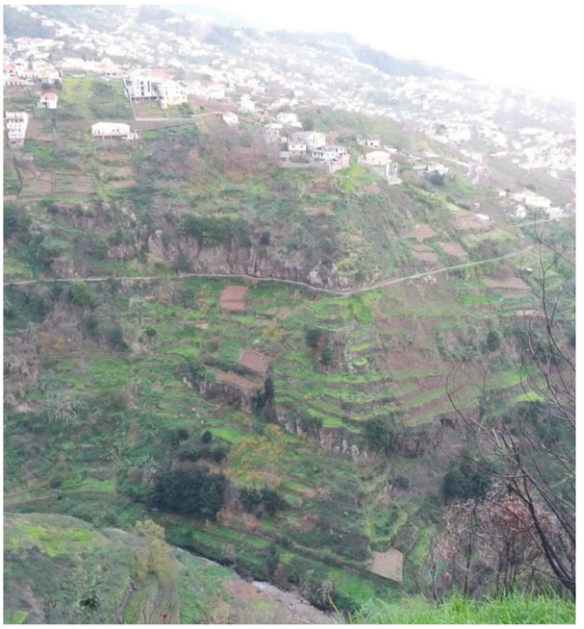

Figure 7. Terraces in Madeira. The thin clear line along the cliff in the middle of the photo is a *levada*. There are now over 3000 km of *levadas* in Madeira (photo SKE).

Portuguese, Genoese, Venetian, Florentine, and later Flemish sugar dealers moved to Madeira. Some of them married the daughters of the local nobility as a way to merge with the upper society. One of them was Christopher Columbus (Vieira 2010; Candido 2022). He joined the Genoese community in Madeira in 1478, where he fine-tuned his navigation skills. He married Filipa Moniz, the daughter of Bartolomeu Perestrello, in Porto Santo. His son Diego was born there. But Columbus gained fame for his 1492 transatlantic crossing, not his brief and unsuccessful career in the sugar business.

Madeira's 'sugar high' was intense but brief. In the late 1400s, ~100,000 *arrobas* (15 kg each) of sugar were produced. Dozens of ships loaded with sugar sailed from Madeira to Lisbon, England, and Northern Europe (Childs 1992). The deputies of the 1481–1482 Cortes praised the wealth of Madeira (Candido 2022). There were about 3000 slaves in Funchal around 1550, for a total population of some 20,000 (Hancock 2009). Most of them were involved in the work-intensive sugar production. In the early sixteenth century, sugar canes were successfully planted in São Tomé, an island off the coast of Guinea. By 1535, the production of sugar in Madeira was down to 68,000 arrobas and had grown to 200,000 in São Tomé. Madeira's sugar canes were attacked by a parasite, the soil became depleted, and the production dropped substantially. In the early 1600s, sugar from Brazil flooded the market: 60,000 tons in 1610, as compared with Madeira's peak of 2500 tons in 1506 (Vieira 2010). About half the Madeira slaves were sent to Brazil.

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Vineyards had also been planted in Madeira since its earliest days (Liddell 1998). A wide range of cultivars were imported from mainland Portugal (Vieira 1993). Dom Henrique ordered cuttings of Malvasia Candida from Crete to be planted there as well. They would produce malmsey, the rarest and most famous Madeira wine. Other types of Malvasia were planted as well. As early as 1455, Funchal was already surrounded by vineyards. But until the 1550s, Madeira's economy relied on sugar, with wine a distant second (Hancock 2009).

Because of Madeira's location within the Atlantic system of currents, Funchal was *the* port of call for ships on their way to distant colonies. They loaded water, fresh foods, and wines – often used as ballast. The first English attempt to reach Madeira and fetch wine was by William Weston in 1481 (Keys 2009), but the first wines exported from Madeira were probably (Vieira 1993) sent to France's François I (1515–1547), and the first Malmsey shipped to London arrived in 1537 (Simon 1906).

During the dynastic union with Spain (1580–1640), wine exports from Portugal dropped because Spain promoted its own wines. But European merchants recognized the opportunity and moved to Madeira. Soon, consulates opened in Funchal: Flanders in 1608, France in 1626, and England in 1658 (Cossart 1984). When Portugal restored its independence from Spain, vineyards had replaced not just sugar canes but all the other crops as well: Madeira produced only wine. All other necessities of life (food, clothing, tools and other manufactured goods) were imported. Being entirely dependent on a single crop would prove unwise.

The demand for Madeira wine in the colonies and England increased (Vieira 1996) to the point that fake 'Madeira' wines appeared on the market. The falsifications (Liddell 1998) involved blending malmsey with lesser wines, mixing (inferior) wines from the north with the (better) wines from the south of the island, importing wines from the Canaries or Açores (worth about one-third the price) and mixing those with local wine. Madeira wines were also shipped to the Açores or Lisbon, blended there with cheaper local wines, and sold as real Madeira. Regulations were passed in 1768 to prevent cheating, but enforcement was difficult.

Shakespeare (1546–1616) mentioned these wines several times in his plays. In 'Henry IV', John Falstaff offered his soul to the devil for 'a cup of Madeira and a cold capon's leg'. This is of course impossible since Henry IV reigned from 1399 to 1413, before Madeira was even settled. But the verse suggests that a cup of Madeira had a value comparable to Falstaff's soul. It must have been pretty good (or Falstaff's soul pretty bad). In 'Richard III', the Duke of Clarence was stabbed and then drowned in a butt of Malmsey. Shakespeare did not specify where that wine came from, and many assumed it to be Madeira. But the Duke was executed in 1478, before the first known shipment of Madeira. It is more likely that this Malmsey came from Crete: the Venetians were actively trading Cretan wines in England at the time.

The Jesuits arrived in Madeira in 1570 and opened a college in Funchal (it is now part of the University). They sought the best locations for vineyards and produced high-quality wines. They received a small vineyard, now called *Fajã dos Padres*, west of Câmara de Lobos. It still produces the most famous Malmsey on the Island. The

access to the vineyard is difficult but spectacular. Fajã dos Padres was within the Jesuits' huge 'Quinta Grande' estate, which they kept until their expulsion from Portugal in 1759 (see later).

Soon after Portugal declared its independence from Spain in 1640, it resumed its friendly relations with England. Madeira became again part of the English trading network in the Atlantic. It greatly benefited from the Navigation Act of 1660 and the Act of Navigation of 1665 (Bazenga *et al*. 2012). The Navigation Act prohibited the import into England in foreign ships of any commodity which was not of their own country. The goal was to prevent the Dutch from bringing wines into England. But the wines from Madeira and Açores could be exported free of taxes to any part of the British Empire on English-built ships (Vieira 1993). The islands now benefited from a quasi-monopoly for shipments of wine to north America. This market grew considerably in the eighteenth century.

None of the trade and tax advantages applied to the wines from the (Spanish) Canaries. And then, the Anglo-Spanish war (1654–1660) closed the Canary wines access to the English market. The 1662 marriage[h] of Catarina de Bragança to Charles II of England further consolidated the links between Portugal and England. The wines from Madeira dominated the Atlantic trade (over 75%) while the Açores accounted for less than 10%. The Canary wines had nowhere to go but Spain. The demand for Madeira wines was beyond the island's production capacity. The total wine production in these years is difficult to estimate because many exports were free of duties and left no trace in custom records. Liddell (1998) wrote that 10,000 to 20,000 pipes were produced annually (depending on the quality of the harvest). These numbers are consistent with the descriptions left by travellers to the islands.

English merchants settled in Funchal (Liddell 1998): Robert Willoughby in the 1590s (Minchinton 1990), Richart Pickford in 1638, William Bolton in 1676, and so on. By 1680, about one-third of the 30 merchants involved in the import–export trade in Funchal were English (Cossart 1984), but they handled much more than one-third of the trade. Bolton was exporting wine and importing foods and other necessities on his ships. He was also a banker. From 1695 to 1714, Bolton wrote numerous letters to Robert Haysham in London (Simon 1928). They are filled with precious details about life and winemaking in Madeira. Then came James Leacock in 1741, Francis Newton in 1745, John Blandy in 1808, just to name a few. By the end of the seventeenth century, the English merchants organized into a chamber of commerce, the 'British Factory' (Bazenga *et al*. 2012), as they did in Porto. It was financed by a levy on shipments. The merchants traded in North America, Brazil, the West and East Indies, as well as England. Typical trade routes went from England to Portugal, Madeira, North America, and back.

In the late 1600s, there were three qualities of Madeira: the best wines for export everywhere except Brazil, an intermediate quality for Brazil and the crews of ships, and the lesser wines for local consumption. The best white cultivars were the Malvasia and Verdelho (the latter accounted for about two-thirds of the acreage), and the red Tinta Negra. Another common white grape was called 'Vidonia' (Liddell 1998). The grape harvest took place in September or early October. The new wine

was racked in January and sold by Easter. Any wine over a year old was hard to sell. The Madeira wines at the time were not the ones we know today. They were not fortified and were drunk young. The wine for export was white, sometimes 'tinted' by the addition of a little red wine, occasionally enriched with raisins or cooked must (Loureiro and Malfeito Ferreira 2021). The red wine was consumed locally. The best cultivar was the Malvasia. Its rich malmsey fetched the highest price but there was little of it and its lifetime was short.

Açores

The colonization of the Açores archipelago started at the same time as Madeira and followed a similar model of captaincies. But the Açores, much further away from the mainland than Madeira, attracted few settlers: it took decades to populate the entire archipelago (Loureiro and Malfeito Ferreira 2021). The process began with the small island of Santa Maria, which is where the first Açores wine was made. Settlers then arrived on the much larger island of São Miguel, and the central group was colonized: Terceira, São Jorge, Graciosa, Faial, and Pico – probably around 1470–1480. Last came Flores and the tiny Corvo island. Álvaro de Ornelas was the first captain of Pico, until 1482. His successor Joz Van Hurtere was born in Burgundy, and the first captain of Terceira, Jácome de Bruges, was Flemish. The early settlers came from Algarve and Alentejo, as well as northern France and Flanders. They came together with Franciscan and Carmelite friars. The Jesuits arrived in Terceira in 1570 and opened a school in Ponta Delgada in 1591. Their presence was recorded in Pico in 1649 (Loureiro 2009).

Cattle, sheep, and goats were imported from the mainland, and fishing was abundant. Wheat, oranges, and vines thrived. Grapevines were planted in areas that could not be used for grain: the coastlines of Pico, Graciosa, and (much less) São Miguel (Silveira e Sousa 2004). The sugar cane did not perform as well as in Madeira. This effort was abandoned when sugar plantations flourished in Brazil in the mid-sixteenth century. Many Açores settlers moved there to seek better living conditions.

The vineyards were most successful on Pico, the 'black island' as much of its surface is covered with black lava flows. Only three or four percent of its surface consists of arable land. The island has no rivers, drinking water, or natural harbour. The landowners and merchants established themselves on the nearby island of Faial where life was more comfortable and a harbour was built. Only the workers lived on Pico. They dug tidal wells for drinking water: the rainwater that accumulates underground is pushed upward by the tides as salt water has a slightly higher density than sweet water.

The Açores were not on the trade routes *to* the colonies but on the way back (Figure 6). The ships that stopped in the Açores were often loaded with colonial goods and did not add much cargo. What they added was wine. The first mention of the quality of Pico wines relative to the other islands was by the priest/historian Gaspar Frutuoso (1522–1591) in his 'Saudades da Terra': 'Throughout the land [Pico] there are many vineyards, which produce good wine and better than on all the

Figure 8. Ancient *currais* protect the vines from ocean winds. Pico mountain dominates (photo SKE).

islands … grapes of all varieties, Muscatel, Verdelho, Mourisco, Açaria and others…' (Loureiro and Malfeito Ferreira 2021). This was the first mention of Verdelho in Pico, before any mention of it in Madeira (they are the same). Its origin is debated. It may have been brought by Franciscan friars. It is a direct parent of today's Arinto dos Açores and Terrantez do Pico, which are distinct from the continental Arinto and the Terrantez in Madeira, respectively.

The vines were planted in basaltic lava soil, which can be very smooth (*lajido* soil). Pickaxes, iron bars, and other tools were needed to crack layers of lava and plant the vines (Loureiro 2009; Loureiro and Malfeito Ferreira 2021). The broken lava rocks were used to build enclosures, the *currais* (corrals), about 1 m high (Figure 8). They protected the vines from the strong ocean winds and, at night, released the heat they accumulated during the day. All the vineyards were located at low altitudes, close to the ocean, and the vines grew low to the ground. The pipes of freshly-pressed wine were transported to the edge of the water and often pushed by swimmers toward small ships. Three-quarter-full barrels floated better and were easier to haul on the decks of ships, where they were filled. Once loaded, the ships crossed the narrow channel to the harbour of Horta on Faial. Thus, the wines from Pico were often labelled 'Faial' because they were shipped from there. Jefferson mentioned Madeira, Port, Claret (Bordeaux), and 'Fyall' (Faial). He sought Faial wines even during his time in Paris (Hailman 2009): they all came from Pico.

In 1650, a record 30,000 pipes of Pico wine were exported to the Netherlands, Flanders, Denmark, and Hamburg by the Labat brothers. Many cultivars were involved, most of them white (Verdelho, Moscatel, Mourisco, Açaria, Alicante, Boal, etc.) and a few red (mostly Bastardo and Tinta Negra). They grew in the same vineyard and their grapes were pressed together. Weaker wines were sometimes strengthened by the addition of cooked must (*arrobe*), an ancient Roman technique. The added sugar ferments until the level of alcohol is too high for yeast to survive.

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The result is a stronger and sometimes sweeter wine, which travels better and has a longer lifetime.

From the Restoration to the Carnation Revolution

Background

For over a thousand years, most wines were short-lived, white or light in colour, with low alcohol levels: they spoiled quickly. In the seventeenth century, spirits distilled from wine, suitable for human consumption, started to be used to fortify wines. It increased their lifetime and allowed them to be transported over long distances without spoiling. This appears to have been instigated by the Dutch or Flemish as they were the first to provide boilers and necessary know-how (see the next section). The Dutch word *bandewijn*, burnt wine, is the origin of 'brandy'.

The fortification of wine came along with a push to improve winemaking techniques, such as better hygiene, use of sulphur wicks (*mèches soufrées*) to disinfect barrels, ullage to compensate for the evaporation in wine barrels, and careful selection of cultivars. All of this aimed at the production of more stable wines with longer lifetimes. Fortification transformed both Madeira and Port wines. Bottles sturdy enough to age wine were invented in the 1630s, but became widely used much later.

Following its independence from Spain in 1668, Portugal was broke. Brazil saved the day. It produced sugar, timber, tobacco, hides and silver, but then gold was discovered in the Mantiqueira mountains in 1694. The state of Minas Gerais turned out to have the richest gold deposits in the world. The production exceeded 25 tons per year in the 1720s (Hatton 2020), when diamonds were discovered there as well. The Bragança became fabulously wealthy. João V (r. 1706–1750) boasted: 'My grandfather feared and owed; my father owed; I neither fear nor owe.' The amount of gold reaching Portugal declined by the end of his reign as smuggling (much of it to England) and tax evasion increased, while alluvial gold became rare (Boxer 1969).

Strong ties with England were re-established as João IV needed England's support for its Restauration war with Spain as well as fighting against the Dutch in Brazil. The 1654 Favourite Nation treaty allowed England to trade with Portuguese colonies, lowered custom duties, and gave substantial privileges to English merchants. The often complicated relations between France and England became even more so. Louis XIV's Comptroller-General of Finances, Colbert (1661 to 1683) implemented strict protectionist policies which caused England to temporarily forbid the import of French wines. In 1679, the English Parliament again banned the import of French wines, this time to prevent Charles II from collecting wine taxes. Imports from Portugal jumped from 427 tuns in 1678 to 1000 tuns in 1679, and then 4000 tuns in 1682 (Phillips 2002). Such increases strongly suggest that much of that wine was in fact French – shipped through Portugal and transferred into Portuguese barrels. Embargoes were in place during the Nine-Years' War (1688–1697) and the War of

Spanish succession (1701–1714). Every time, English wine imports from Portugal and Spain increased: over 2000 tuns and three hogsheads of wines from the Douro valley made their way to London from 1669 to 1683. For 1694/95, the numbers were 915 butts, 353 casks, 1198 hogsheads, seven pieces, 15,930 pipes, and 34 tuns, as well as 51 casks, five hogsheads, four pipes, and three tuns of brandy (Simon 1906). But these wars were bad for the Atlantic trade. There are few records of Madeira in those years. Sack (especially from Jerez) became more popular in England (Simon 1906), possibly because Madeira wines were difficult to find.

The commercial part of the Anglo-Portuguese 1703 Methuen treaty (Phillips 2002; Antunes and Salvado 2022) benefited the wine trade, especially the red wines from the Douro valley and the Atlantic Islands. Madeira wines, already popular in England, could now be exported to North America without passing through London first. The English import taxes on Portuguese wines were set at less than two-thirds those applied to French wines, and English merchants could establish trading house in Porto: Cockburn, Warre, Croft, etc. Most Port wines were already fortified. The Portuguese economy experienced a solid growth until 1755 (Palma and Reis 2019). However, the Methuen treaty provided English textiles easy access to the Portuguese market. At first, Brazilian gold corrected that imbalance. In the long term, England was the clear winner.

On 1 November 1755, most of Lisbon was destroyed by a huge earthquake and tsunami, followed by fires: one of the worst natural disasters ever to hit Europe (Shrady 2008; Pereira 2009; Françoso 2022). Tens of thousands of people died and many more were injured, out of a total Lisbon population of about 250,000. José I (1750–1777), sheltering in a tent in Belém, was overwhelmed. Sebastião de Carvalho e Melo proposed to 'bury the dead and feed the living'. The King put him in charge (Shrady 2008). He started by forcing the fleeing population back to Lisbon and ordering the public hanging of (suspected) looters. He organized the reconstruction of the capital, with wide avenues and public parks, and financed it with a 4% tax on all retail sales in the city (Page 2002). Carvalho was efficient and hard-working, with a definite authoritarian streak. He was soon given quasi-absolute powers, and eliminated those who opposed him. In 1759, he expelled the Jesuits from Portugal and its colonies: they had become a state within the state. He reformed the educational system, reduced the power of (but could not eliminate) the feared Inquisition, and destroyed many of their files. In 1761, he banned slavery in mainland Portugal, but not its colonies where slaves were needed.

Carvalho's impact on the history of wine involved strictly regulating Port wines and delimiting their area of production, starting in 1757. His regulations sharply increased the quality and reputation of these wines. In 1769, Carvalho became Marquês of Pombal and is often referred to simply as 'Pombal'. His power evaporated when José I died and his daughter Maria I (1777–1816) became Queen. Pombal ended up in internal exile and died soon after.

In 1789, the storming of the Bastille prison in Paris triggered the French Revolution. Four years later, Louis XVI and his wife Marie Antoinette were publicly guillotined. This was duly noted by all European monarchs, whose thrones suddenly

felt fragile. After a few bloody years of revolutionary rule in France, Napoleon emerged as First Consul then, in all modesty, Emperor. Multiple coalitions were unable to stop his territorial expansions. France soon controlled much of western Europe, but not all of it: England is an island, and Nelson was a very successful vice-admiral. He defeated the French navy off the coast of Egypt in 1798, and crushed the French and Spanish navies at Trafalgar in 1805. Napoleon gave up hope of invading England, and decided to blockade it instead. That marked the beginning of a very troubled period for Portugal (Gates 2001; Esdail 2015).

Napoleon's general Junot ordered Portugal to close its ports to English ships, confiscate English property, and imprison or expel all the English merchants. Portugal tried to compromise and play for time, but there was no time. In the fall of 1807, the French and Spanish armies invaded Portugal. Just days before their arrival in Lisbon, Queen Maria I, Prince regent João, and the entire court (about 10,000 people), courageously boarded ships bound for Brazil and fled the country under the protection of the British Royal Navy (Wilcken 2005; Mello e Souza 2022). They took with them as much of the country's treasures as the ships could carry. The French took over Portugal, but the population resisted. The talented Arthur Wellesley, future Duke of Wellington, was sent to the rescue (Hatton 2020). He pushed the French away from Portugal and built 152 fortifications north of Lisbon (Robertson 2010). They stopped the 75,000 French troops under marshal Massena during the third French invasion. These wars destroyed the Portuguese economy (Palma and Reis 2019), and brought famine and misery across the country.

The French also had problems in Spain. It was ruled by Napoleon's appointed King, his older brother Joseph – locally known as 'Pepe Botella' for his love of wine. The Spanish popular rebellion began in 1808 with the 'Dos de Mayo' uprising in Madrid, which quickly spread across Spain. Napoleon's war against Portugal had become the Peninsular War (Gates 2001; Esdaile 2015; Robertson 2010), a very brutal affair illustrated by Goya's 82 'Disasters of War' prints. The French were ultimately expelled in 1813, while Napoleon was suffering an even worse defeat in Russia. After a brief exile in nearby Elba, Napoleon returned to France only to suffer his final defeat at Waterloo (1815). He was sent to the distant island of Santa Helena where he died a few years later. The end of Napoleonic wars marked the beginning of a long economic recession throughout Europe.

João VI was enjoying a comfortable life in Rio de Janeiro while Portugal was effectively ruled by the unpopular Lord Beresford. He had his hands full with the Liberal Revolution which began in Porto in 1820. He sailed to Rio to consult with the King but, upon his return to Lisbon, he was prevented from docking. He sailed to England instead. João VI finally returned in 1821. His son Pedro remained in charge in Brazil, promptly proclaimed Brazil's independence (1822), and appointed himself emperor. In Portugal, João VI accepted the liberal constitution of 1822 which established a constitutional monarchy with limited powers.

After João's death in 1826, Emperor Pedro named his 7-year-old daughter, Maria de Gloria, Queen of Portugal and his brother, Miguel, regent. Miguel ignored the new constitution and claimed absolute power. Pedro returned to Porto, starting the

War of the Two Brothers (1831–1834) – as if Portugal needed yet another conflict. The English intervened and settled the situation: Miguel abdicated and Pedro became regent. Much of the country was destroyed and Portugal was ruined with considerable debts, mostly to England. In 1834, Pedro abolished all religious orders[i] and confiscated their estates. These were auctioned off, but this raised insufficient funds to make a meaningful difference.

The economic and political situation was bad across all of Europe. The year 1848 was marked by violent popular anti-government rebellions in major European capitals, including Lisbon (Rapport 2008). In France, the Second Republic replaced the monarchy, but other authoritarian regimes remained in power.

The state of Portuguese viticulture in the nineteenth century was summarized by Jullien[j] (1816) and Jullien and Jullien (1866). In 1816, he wrote that Portuguese wines were generally inferior to Spanish ones except for those produced in the Alto Douro and Setúbal. Many wines were field blends with up to 67 cultivars growing in the same vineyard! He noticed that along the Minho, the vines were trained high above ground, often on trees. Some still are today (see later). Alentejo produced just enough wine for its own needs. The dry or sweet fortified wines from Carcavelos and Oeiras were shipped to England as 'wines from Lisbon'. The best table wines came from Colares. In the 1866 edition, the comments are similar but with substantial new plantings in Alentejo. He ranks only the Port wines as 'first class'. The red wines from Minho and Estremadura as well as the white muscat wines are 'second class'. All the other Portuguese wines were ranked below that. His comments on Madeira and Açores are in the relevant later section, as are those on Port.

On 27 May 1871, Antero de Quental (1842–1891) discussed the reasons for Portugal's decline. He singled out the long period of religious conservatism (he referred to the Inquisition as 'the nation's grave'); the political centralization imposed by absolute rule; the economic structure during the age of discoveries: too much easy gold, too little hard work, no fiscal management; and the brain drain associated with the expulsion of the Jews. He did not mention that, starting around 1760, the industrial revolution was fundamentally transforming England and other western countries while Spain and Portugal were falling behind.

Queen Maria de Gloria died in 1853. Her successors Pedro V, Luís I, and Carlos I tried to stabilize and modernize the country, but the economic situation remained poor. And then the world's vineyards were attacked by several American plagues: powdery mildew (oïdium), phylloxera, and downy mildew. Portugal declared bankruptcy in June 1892, then again in May 1902, causing additional disruptions to an already impossible financial climate. Carlos I was assassinated in 1908. His son Manuel II, the unfortunate last King of Portugal, only reigned for a few months. The October 1910 revolution established the first Portuguese Republic. Manuel went into exile in England. None of this established political stability, with 45 unsuccessful governments in 16 years (Hatton 2020).

Portugal was initially neutral during the First World War, but had three strategic reasons for entering the war: preserve its colonies in Africa – strategically important for Britain; counter the Spanish neutrality; and gain a seat at the table at the end of

the war (Hatton 2020). In March 1916, it provoked Germany into declaring war by seizing German and Austrian ships. And then, as a political gesture, Portugal sent 55,000 men to the western trenches in 1917. Most of them perished. In retaliation, German U-boats went into Funchal harbour in December 1916 and torpedoed several ships. They did it again in December 1917.

The end of the First World War did not bring economic relief to Portugal, or anybody else. Europe was broke and its population depressed by years of senseless destruction. The 'Spanish Flu' pandemic killed more people worldwide than the First World War. Portugal experienced a period of hyper-inflation and its currency, the escudo, collapsed. Viticulture badly needed large investment to rebuilt the vineyards, modernize ancient wine-making equipment, and mechanize viticulture. No money was available. The government was powerless.

In 1926, the political and financial crises led to a military dictatorship under General Óscar Carmona. Two years later, he appointed António de Oliveira Salazar, professor of political economy at the University of Coimbra, as finance minister (Léonard 2014a; Hatton 2020). He ruthlessly raised taxes, slashed spending, balanced the budget, and stabilized the currency, all within about one year. Dissenting voices were silenced. In 1932, Salazar became Prime Minister and President of the Council of Ministers, giving him near-absolute power. President Carmona became a figurehead. Salazar was extremely socially conservative and fervently Catholic. People commented: 'God in Heaven, Salazar on Earth'.

In 1933, Salazar introduced a new constitution, the *Estado Novo*. Now the State regulated everything: the size of companies, production, prices, exports, and so on. Everything was placed under the supervision of an administrative body appointed by the state. Fundamental freedoms such as the right to free expression or association were replaced by censorship and a political police. In 1936, Salzar established a mandatory youth movement, the *Mocidade Portuguesa*, reminiscent of Hitler's youths. In 1942, the political police became the PIDE (*Polícia Internacional e de Defesa do Estado*), feared for its use of torture and secret prisons: Tarrafal (in Cabo Verde), Aljube, the fort in Peniche, Caxias (Lisbon area), the fortress of São João Baptista (on Terceira in the Açores), amongst others. International disapproval of the Salazar regime was illustrated in the highly-critical 22 July 1946 issue of *Time*. The magazine became illegal in Portugal for years.

Salazar focused on Portuguese goods such as corks, olive oil, and especially wine. Wine and viticulture generated jobs and provided much-needed foreign currency. When he gained power, the Portuguese wine market was in disarray. In 1933, the Federation of Winemakers of Central and Southern Portugal was established, a cooperative charged with removing excess wine from the market and storing[k] it, in order to stabilize prices. In 1937, it was replaced by the *Junta Nacional do Vinho* (similar juntas were created for olive oil, fruits, etc.). The junta had a budget, broad responsibilities over production and trade, proposed new laws that were quickly enacted. Small wineries were incorporated into cooperatives with technical assistance services. They improved the organization and cost management.

Salazar kept Portugal away from the Spanish Civil War (1936–1939). He wished to keep Portugal neutral during the Second World War but, in the early years, leaned on the side of Hitler and Mussolini. Portugal traded with both Axis and Allied forces, especially in tungsten,[1] a metal used in ammunition and, later, for the nozzle of German rockets. The Açores were a critical asset because of their central position in the Atlantic ocean (Herz 2009).

Salazar had allowed the German navy to establish a supply service in Horta (Faial island) for U-boats. They devastated allied shipments of war material and troops on their way to England and Europe's battlefields. By 1941, several million tons of precious cargo had been sunk by an increasing number of U-boats. Protecting the convoys along the central Atlantic route became a very high priority. In the fall of 1943, Churchill invoked the 1373 Windsor Treaty, Salazar agreed, and a Royal Air Force group established a functioning air base at Lajes Field on Terceira. Germany's supply base in Faial could no longer be used, and the U-boat threat to shipping in the central Atlantic was considerably reduced. The United States pressured Salazar to accept an American presence at Lajes Field, which was expanded to accommodate heavy bombers. From the Açores, they could easily reach European targets. The Ally presence in the Açores was the key to Portugal becoming a founding member of NATO in 1949.

At the height of the Second World War, wine exports were at an all-time low. They recovered afterwards, but slowly. Only 1500 pipes of Port wine were exported to England in 1952, as compared with an annual average of over 30,000 pipes in the 1930s. The wine growers still produced high-quality grapes but that wines had nowhere to go. Precious little money was coming in, and many winemakers faced bankruptcy.

This is when Fernando van Zeller Guedes stepped in with an ambitious project: produce inexpensive, high-quality, fun-to-drink table wines that would appeal to a broad audience. His father owned Quinta da Aveleda in the Vinho Verde region, where the winemaker Eugène Hellis had created just such a wine in 1939: the Casal Garcia vinho verde. It was very popular and ended up being exported all over the world.

Fernando wanted to work with the unsold (red and white) grapes from the Douro, and then, other regions. Fernando had deep connections in the wine industry and found 15 co-investors to start a new company: *Sociedade Comercial dos Grandes Vinhos de Mesa de Portugal*, now known as SOGRAPE (Pereira 2003). The company leased space and equipment in a cooperative in Vila Real. Fernando went on his way across the Douro Valley by foot, bicycle, or donkey to purchase wines. By the summer of 1943, SOGRAPE released its first wines: Cambriz, Vila Real Branco, Granado Tinto, and… Mateus rosé. The latter was something new for Portugal, and it was slightly sparkling with a sweet touch.

Mateus was an immediate success, and came to define Portuguese table wines for several decades. The shape of its bottle was inspired by the canteen used by soldiers in the First World War. At first, these wines were shipped to Brazil, then to colonies in

Africa, but soon became an international hit. The Matteus reached the English market in the late 1950s. Twenty years later, some 50 million bottles were shipped to 120 countries, including the USA. Today, the company is global, owns many wine estates and brands. A great success story that emerged from the misery of the Second World War.

Portugal joined the UN in 1955, the European Free Trade Agreement in 1959, and the Monetary Fund in 1961. The Portuguese economy started growing at healthy pace (Palma and Reis 2019). But Salazar was adamant about keeping the Portuguese colonies in Africa. This resulted in independence wars in Angola, Mozambique, and Guinea-Bissau, starting in 1961. These unwinnable wars absorbed a large fraction of Portugal's annual budget. Many younger Portuguese fled the country (mostly to France) to avoid misery and conscription into the army. Salazar suffered a stroke in 1968 and died two years later. His dictatorship survived until 1974. Before addressing the subsequent evolution of Portuguese wines, we should go back and discuss wine-related issues for the period 1640 to 1974.

Distillation and Fortified Wines

From the fall of Rome to the seventeenth century, the vast majority of wines were light in colour, low in alcohol, and drunk young: a one-year-old wine was rarely drinkable. There were exceptions of course: special wines included added raisins or boiled must, which made them stronger, sweeter, longer lived, and better able to withstand transportation. Some Portuguese wines or the sweet wines from Crete were in this category. But they were expensive and the quantities produced small. There were few red wines: they required long macerations to extract the colour from the skins. This also extracted tannins from the skins, pips, and stems, which rendered the wines harsh. Again, there were exceptions: in the early fifteenth century, the foot-trodden wines from the Douro were red, aromatic, and could age several years without spoiling (Pereira and Almeida 1999).

Starting in the age of explorations, wines routinely travelled great distances, for example Madeira to Indonesia. These wines had to arrive in good condition, and few wines could achieve that. The Dutch or the Flemish seem to have been the first to fortify wines with spirits obtained by distilling inexpensive wines: fortification much increased the stability of wines. The word 'brandy' originates from the Dutch *brandewijn*, burnt wine. Many wines were fortified to 'improve' them (regardless of travel requirements) or stop an ongoing fermentation and preserve some of the natural sugar in the must (Port, Madeira, Moscatel de Setúbal, and so on). All of this was new and experimental. It took several decades from the availability of the first commercial boilers to the general acceptance of fortification, the standardization of the processes, and then the aging of wines. Another byproduct was the production of refined spirits such as Cognac or Armagnac (Estreicher 2023).

The art of concentrating a liquid substance by evaporation dates back to ancient Egypt. The technology progressed during the eighth- to thirteenth-century Muslim

Renaissance. The original focus of distillation was the production of perfumes and the search for the 'essence' of substances. *Al-kohl* referred to the residue of distillation, sometimes just a white powder. In Córdoba, the physician Albucassis (Al-Zahrawi, 936–1031) was the first to distil grape wine and produce small amounts of what we call alcohol today: ethanol. For several centuries, only small quantities of wine were distilled, for pharmaceutical purposes. The spirit likely contained too much methanol for human consumption. There was certainly far too little to fortify wines.

The distillation of fermented liquids requires separating ethanol from water, which evaporate at 78ºC and 100ºC, respectively. If the temperature is maintained somewhere in-between, more ethanol than water evaporates. The vapours condensate in a cooling tube (the *anbiq*), and that liquid contains a higher concentration of ethanol than the original. The process is repeated to achieve ever higher concentrations of ethanol, up to the maximum 96%. It is doubtful that anybody managed to reach this degree of purity in medieval times: the technology was too primitive. But 50 or 60% ethanol was likely achieved.

Distillation arrived at the school of medicine in Salerno (southern Italy) in the mid twelfth century and then spread. Precisely when it arrived in Portugal is not known (to me) but small amounts of alcohol for pharmaceutical purposes were probably available by the thirteenth century, as was the case in Germany, France, and other European countries. But there were no commercial boilers for the large-scale production of spirits.

As is often the case, progress was achieved when there was a need and money to be made: large volumes of wine had to be shipped over long distances and arrive in good shape. The solution was to fortify it with spirits. Fortification began slowly in the early sixteenth century, as shown by studies of tax records and shipping cargos. Francis Brumont (2011, 2014) researched 4000 ship cargos originating in western France between 1504 and 1570. He found that only six shipments included spirits, all in small quantities. The first barrel left Bordeaux for Picardie in 1513, followed by one barrel to the Netherlands in 1515, and another to Ireland in 1517. The first toll paid for spirits at Øresund – the entrance to the Baltic – was recorded in 1562. The first known distiller in France, a Jehan Serazin, was listed as *faizeur d'eau-de-vie* (maker of spirits) in the Charente region in 1571. The spirits were first shipped to Nordic countries where no wine was produced. But alcohol was soon used to fortify wines and help them survive transport by sea. The commercial distillation of wine was promoted by the Dutch and the Flemish (Enjalbert 1953; Dion 2010; Brumont 2011, 2014). In 1631, 2200 barrels of spirits were shipped from Nantes. That same year, 245 boilers were unloaded in Nantes, 235 of which came from the Netherlands. Records at Øresund show that tolls were paid for 800 barrels of spirits in 1650, 1400 in 1680, and 2700 in 1700.

Starting around 1600, the Dutch became major players in the world trade, including wines. Their ships sailed around South Africa, where the Dutch established the victualling colony that became Cape Town (Estreicher 2014), and then reached the Spice Islands. On the east coast of France, the Dutch purchased large volumes of

cheap wines and distilled or fortified them, while the English focused on the high-end, expensive Bordeaux wines (Estreicher 2023).

At first, the French did not have much of a navy to compete with the Dutch, and the English East India Company had far fewer resources than the Dutch *Verenigde Oostindische Compagnie* (VOC). This resulted in a series of wars involving the English (starting in 1652) and later the French against the Dutch (1672–1678). Religion was a complicating factor in Catholic France: the Dutch were Protestant. Unable to pursue the wine trade in France during the war, the Dutch purchased more wines from southern Europe. Portuguese and Spanish wine exports increased substantially until the end of the Franco-Dutch war.

After the war, the Dutch resumed their wine trade in France where they were treated better than the English. This led Charles II of England to forbid the import of French wines. The prohibition lasted from 1679 to 1685. The result was a large increase of wine imports from Spain and Portugal, but the numbers are suspicious. Portugal shipped 7000 barrels to England in 1681 compared with 59,000 in 1682. At the same time, English imports from France dropped from 42,000 barrels in 1677 to 0 in 1682. After the prohibition ended, Portuguese exports to England dropped to 1200 barrels while the French exports returned to their original level (Enjalbert 1953). These fluctuations only make sense if most of the 1682 wine imports from Portugal were in fact French wines shipped via Portugal where they were transferred into Portuguese barrels.

The Dutch much preferred to ship fortified wines because they were more stable (Enjalbert 1953; Dion 2010; Brumont 2014). They likely pressured winemakers and traders to distil more and fortify their wines. They also brought decades-long experience with the commercial boilers required to perform large-scale distillation. Winemakers easily accepted distilling their unsold (one-year old) or lower-quality wines: spirits sold for higher prices than vinegar. But they were reluctant to fortify their wines and change the generations-old winemaking ways. Inertia at work. Precisely when fortification became widespread in various wine regions is not known: it was a gradual process. But distillation and fortification were certainly performed in the mid- to late-1600s in most wine regions.

In the Açores, the Jesuit Maldonaldo reported: 'at the beginning of the 17th century, the family Brum da Silveira had [...] two stills in Pico' (Loureiro and Malfeito Ferreira 2021). That brandy was probably first used to fortify the local wines by the late-seventeenth century. In Madeira, Cossart (1984) mentions that brandy was produced by the firm Durrell & Morgan in 1704. In his Letters (Simon 1928), Bolton states that, as the wine business was slow during the War of Spanish Succession (1701–1714), he distilled some of his surplus wine and used the brandy to fortify his better wines in order to make them last. Thus, the first evidence of fortification in Madeira dates back to the early 1700s. In North America, the 'Poor Richard's Almanach' recommended adding brandy to Madeira in 1743 (Hancock 2009).

Fortification in Madeira was not done systematically for several decades (Minchinton 1990). In a letter dated 27 October 1753, Francis Newton wrote (Cossart 1984): 'I really impute the complaints I have had of wines not putting a bucket

or two of brandy in each pipe as other houses do'. By 1772, everyone in Madeira fortified their wines. The merchants typically added a bucket or two per pipe. French brandy was the most desirable. But in the early 1800s, the import of foreign brandy into Madeira was forbidden, and that from Portugal heavily taxed. The spirits then came from the distillation of wines produced on the north side of Madeira and from Porto Santo (Vieira 1993). Some buyers added even more brandy: a John Baker from Sussex added 3 quarts of brandy to each pipe of Madeira (Minchinton 1990).

As for Port wines, Simon (1906) reports that Flemish wine merchants were established in Porto in 1596. He does not say if they were involved in the production of spirits, and there is no evidence of local distillation or fortification at that time. Yet, these Flemish wine merchants must have been aware of it. The frequently-repeated story of two young Englishmen who, in the 1670s, discovered that monks near Lamego added brandy to produce a sweet Port wine is not documented (Pereira and Almeida 1999) and has been called a nineteenth-century invention (Enjalbert 1953). But Benedictine monks did add brandy (13 to 18 litres per pipe) to their Port wine by 1678 (Martins 1990). The first documented reference to the addition of brandy *before* the end of the fermentation dates back to the early 1700s (Martins 1990; Pereira and Almeida 1999).

Commercial distillation in Portugal most likely started in the middle of the seventeenth century. Indeed, in 1694/95, 51 casks, five hogsheads, four pipes, and three tuns of Portuguese brandy were shipped to London (Simon 1906). These spirits were not produced for the high-end brandy connoisseur. Only low-quality and old wines were distilled, and the main use of the spirits was to fortify weaker wines. Since fortified wines gain an unwanted brandy flavour, they were barrel-aged for a couple of years for this flavour to fade away.

The big change was to switch from naturally-fermented to fortified wines. A smaller decision was *when* to fortify. If done *after the end* of the natural fermentation, the fortified wine was dry: dry sherry, some white Ports, and dry Madeira for example. If enough alcohol is added *during* the fermentation, the yeast dies and the fermentation stops. This preserves some of the natural sugar: most Port and Madeira wines fall into that category. Fortification can also be done *before the start* of the fermentation: adding spirits to grape juice kills the yeast and no fermentation takes place. The result is a grape juice 'liqueur' with 18% to 20% alcohol, such as the Pineau des Charentes (Cognac), Macvin (Jura), or Jeropiga (Portugal).

Fortified wines such as Sherry, Madeira, or tawny Port age beautifully in wooden barrels. But aging unfortified (red or white) wines for several years normally requires sturdy glass bottles securely stoppered with corks, in order to prevent oxidation. The first glass bottles thick and sturdy enough to transport and age wine were made in England in the 1630s by Sir Kenelm Digby (Twede 2012). His bottles were onion-shaped with a broad base, and were designed to be kept upright. They were mouth-blown, a slow and expensive process. In the mid-1700s, the importance of laying wine bottles on their side for aging was recognized. This keeps the corks moist inside the bottle which maintains a tight seal: the wine can age gracefully. Cylindrical bottles with a longer neck, similar to modern wine bottles, were moulded. Yet, for a long

time, the overwhelming majority of wines were still sold in barrels: the costs of bottles, bottling equipment, labels, and the required fining of the wine were too high for most producers. Further, England prohibited the import of wine in bottles until 1867 (an exception was made for Champagne in 1800). Until then, Port and Madeira wines had to be shipped in barrels to England, where they could be bottled by the merchant – often after blending or other manipulations. The first fully automatic bottle-making machine was invented by Michael J. Owens in the early 1900s. His machine sucked a precise amount of molten glass from a furnace into a mould. In 1910, his '10-arms' model produced an amazing 23 pint-size bottles per minute. The price of bottles plummeted.

Madeira and Açores

After the renewal of ties between Portugal and England in 1640, the Atlantic trade resumed (Vieira 1993; Hancock 2009). A substantial boost resulted from the Navigation Acts of 1651 and 1660. They allowed wines from Madeira and Açores (but not the Spanish Canary Islands) to be delivered tax free on British ships to the West Indies and North America without having to stop in England first. The importance of the North American market increased substantially (Vieira 1993; Loureiro and Malfeito Ferreira 2021). George Washington served Madeira to his guests at his wedding in May 1759, and John Adams wrote in his diary that he often drank 'a large portion' of it (Vieira 1996).

The Methuen treaty (1703) provided more protections to Portuguese wines in British markets, while Spanish and French wines were taxed heavily. Madeira benefited for several reasons. First, the geographical location of the islands made it an almost required stop for ships sailing from Europe to the colonies. Second, Madeira wines already had a strong reputation and were in big demand. Third, the British merchants were exceptionally well organized there and many of them were involved in shipping as well. In contrast, the Açores were on the return path from the colonies, the reputation of their wines was not as strong, and the (mostly Portuguese) wine merchants in Faial did not carry the same business weight as those in Madeira: there was no equivalent of a 'British Factory' in Faial.

Most Madeira wine dealers were Portuguese, but the largest volume of sales was handled by English traders (Cossart 1984). They did not blend well with the local population. They belonged to the Anglican Church while the people of Madeira were strongly catholic. Further, the trader's goal was to maximize profits. They purchased pipes of wine at the lowest possible price, then sold and shipped it at a much higher real market value: the demand often exceeded the supply (Vieira 1993). The profits did not reach the local growers and winemakers. And then the same British traders also imported (on the same ships) all the foods and basic necessities for the island – which they sold at marked-up prices. The local population struggled while the British merchants and the British Factory became very wealthy. It funded a church, a hospital, and even a burial ground for its members: until 1761, non-Catholics had to be buried at sea (Cossart 1984).

The number of pipes shipped from Madeira rose ten-fold from the 1650s to 1815, with a peak of 60,000 pipes in 1794 (Hancock 2009). In the Açores, the wine production increased on Pico and São Jorge under the supervision of Carmelite and Franciscan friars as well as Jesuit priests, but never reached the Madeira levels. The estimated production was just 8000 pipes in 1632. It jumped to 30,000 in 1649, and then to a record 40,000 in 1658 (Loureiro and Malfeito Ferreira 2021). After that, the production stabilized around 20,000 pipes a year. The number of exported pipes was of course much less.

Madeira was the wine powerhouse of the Atlantic. For much of the eighteenth century, it produced about three-quarters of all the wine exported. The Açores and Canaries produced only 5 or 6% each. In order to improve the visibility of their wines, the Açores merchants often labelled them with names associated with Madeira. The Pico wines reached the port of Horta on Faial where the merchants 'improved' them to make them taste like Madeira. They probably added raisins to increase the sugar content and achieve higher levels of alcohol (Loureiro and Malfeito Ferreira 2021).

In the few locations where the Verdelho matured exceptionally well, late harvests allowed the production of *passado*, a very special wine which naturally ferments up to 18 to 19% alcohol (see later). The Jesuit priest António Cordeiro (1641–1717) claimed that this wine 'in no way yields to what in Madeyra is called Malvazia'. It was shipped to Russia, often as 'Malvasia de Faial' even though it actually was a Verdelho de Pico. It reached the court of the Tsars of Russia in the eighteenth century, via London (Vieira 1989). Bottles of it were found in the Tsar's cellars after the Russian Revolution of 1917.

In 1776, the representatives of the 13 North American colonies signed the Declaration of Independence and toasted the event with Madeira (Hatton 2020). Since Madeira wines appear together with wines from the Açores in North-American customs records of the eighteenth century (Andrews 1964; Francis 1973), it is possible that wines from Pico were also part of the celebrations.

Ships from North America brought flour and other basic food items to Madeira and returned loaded with wine (Vieira 1989). That trade was disrupted during US Revolutionary War (1775–1783): Portugal was an ally of England and American ships were banned from all its harbours (Hancock 2009). Some trade continued with British ships, but shipments to North America dropped by two-thirds. Yet, these exports accounted for almost 60% of total Madeira exports, and most of the cereals consumed on the island came from North America (Vieira 2012). The population of Madeira grew from ~50,000 in 1754 to ~80,000 in 1797: with less money coming in, the demand for imported foods and other goods increased. When poor crops or difficult war years caused a drop in food imports, many people in Madeira survived on roots and fruits.

During the Revolutionary War, wine stocks piled up in Madeira warehouses (Hancock 2009). This provided the impetus to find ways to age these wines gracefully. This involved long exposures to heat.[m] Since the mid-1700s, American importers realized that Madeira wines that had travelled across the tropics and the equator tasted much better than the wines of the same vintage that remained in

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Funchal. The wines had spent months at sea, continuously shaken and exposed to tropical temperatures. Somehow, this rough treatment accelerated the aging process and considerably improved the wines. This would be highly detrimental to 'normal' wines, but Madeira wines were fortified, acidic, and at least partly oxidized. The wines from Açores also benefited from such transport.

The first deliberate shipping of young wines to the West Indies to accelerate their aging occurred in 1749 (Hancock 2009). By 1775, it had become well established. These *vinho da roda* were sought after and sold for much higher prices than Madeira wines that had not travelled (Vieira 1996; Liddell 1998). A few vinho da roda were still produced in the early twentieth century. Croft (1787) wrote:

> the wine[s] ... become better the more they are conveyed to the South, or the warmer they are kept. Sometimes in England they put them in stoves or hot houses...; in America they keep them in cisterns on the top of the houses. Somehow, heat and rough handling improve the wines. No other wine exhibits this property.

In order to reduce the costs associated with such long shipping, Pantaleão Fernandes, a merchant in Funchal, improved his wines by keeping them in the sun for extended periods of time (Vieira 1996; Liddell 1998; Loureiro and Malfeito Ferreira 2021). The idea of heating wines on land in 'hot houses' was there to stay. A lot of experimentation was required to find the optimum temperatures, the heating and cooling rates, and the length of time, but the *estufagem* system was born and gradually replaced the expensive trips across the tropics. The first estufa in Funchal was a storage area heated with stoves: moderate heating for 6 months or so achieved results comparable to a long tropical trip. However, excessive heat caused wines to get an unpleasant 'burn' flavour and low residual alcohol. The temperature had to be controlled and the wines placed in properly sealed barrels to prevent the alcohol from evaporating. A good method involved a series of rapid heating to 70–80°C followed by slow cooling (Vieira 1996). Experimentation continued for decades. Wine-heating stoves were also used in the Açores with Pico wines in the late eighteenth century. This was done in Faial by storekeepers. The fortified wines spent 30 days at 60°C, and were then exported as 'Pico-Madeira'.

In the first edition of his 'Topographie', Jullien (1816) wrote that the Madeira wines had a solid reputation, with an annual production of 25,000 to 30,000 pipes. The most esteemed wine was made with the 'Candida' (Malvasia Cândida) grape and improved with age. He mentioned (but did not name) three white cultivars (probably Sercial, Boal, and Verdelho), and wrote that their 'white [wines] are dry, refined, and almost as expensive as malmsey'. He also mentioned that two red grapes (probably Bastardo and Tinto) produced wines for local consumption. He did not discuss any heat treatment.

In the fourth edition of his 'Topographie' (Jullien and Jullien 1866), Jullien wrote that the best wines were made in the south part of the island, and listed six white cultivars: Malmsey (the best), Vidonia (the most abundant), Boal, Sercial (rare and excellent), Muscadel, and Alicante. The red grapes were the Bastardo, Tinta Negra,

and a table grape called Ferral. The wines were fortified following fermentation and then the 'barrels of wine were left in *estufagem* for several months, which mimicked 5–6 years of aging or travel to India'. But the wines in estufa did not achieve the quality of the *vinho da roda*. Jullien also described another aging process: 'burying tightly closed and wrapped bottles in a hole filled with horse manure[n] for 6 to 12 months'. Who came up with that idea is a mystery.

After the Revolutionary war, the Madeira and Açores trade with North America picked up, but now in competition with Spanish and French wines. This was somewhat compensated by sales in Northern Europe and Russia. At that time, most of the island wines had either undergone heat treatments in Madeira or Faial, or had travelled for months. Some wines were bottled with a label indicating where and on which ship(s) they had been. Aged wines shipped in pipes (the most common situation) had the vintage year marked on the barrel. Such wines were sold at a premium and were in big demand. The taste for older Madeira wines increased. Soon, wealthy customers demanded 5-, 10-, or even 15-year-old wines (Hancock 2009).

The sweetest, rarest, and most delicately-flavoured Madeira wine was made from the Malvasia Cândida. As its production was very small (80 to 100 pipes), it was often sold in hogsheads. The Sercial, Boal, and Bastardo, were more abundant, but the most planted grape was the Verdelho (Hancock 2009). Several cultivars often grew in the same vineyard, were harvested together, and the wine was sold as 'Madeira'. The Sercial grown at higher altitudes produced a highly-praised dry white wine. The red Tinta Negra was ubiquitous and used in blends. From best to worst, the wines were labelled Malvasia, London Particular (a blend of Verdelho and Boal), London Market, New York, Virginia or Jamaica, and Common or Cargo (Loureiro and Malfeito Ferreira 2021). Since the late seventeenth century, a Madeira made of water-diluted Verdelho was shipped to the American market as 'Rainwater'. It was said to have originated when some unbunged pipes were accidentally left outside in a storm. On Pico island, the best white grapes were the Alicante, Boal, Galego, Verdelho, and Terrantez do Monte. The red grapes were the Bastardo and Tinta.

The British occupied Madeira in 1801–1802, at the very beginning of the Napoleonic wars, in order to prevent any French attempt to occupy the islands. The British returned during the Peninsular war, from late 1807 to 1814 (Liddell 1998; Bazenga *et al.* 2012). At that time, 26 British firms (Leacock, Cossart, Gordon, Newton, Lawton, and so on) had an effective monopoly on the export of wines and the import of foods and other necessities (Minchinton 1990). The foods came mostly from North America which was also the main recipient of Madeira wines. Other markets for the best Madeira wines included England, continental Europe, and Russia. The colonies received lower-quality wines.

A legend links Napoleon to a 1792 Madeira. As he was on his way to his exile in Santa Helena in the summer of 1815, his ship stopped in Funchal. He acquired (or received?) a barrel of 1792 Madeira from the British consul who was paid in gold coins (or was not paid at all?). Different versions of the story specify that it was a Sercial or a Boal. This wine remained untouched (or was partly consumed?) in Santa

Helena, and then returned to Funchal where it was acquired by Blandy's in 1822 and then bottled in 1840. This whole story may have originated (Croft-Cooke 1961; Liddell 1998) with a Dr Grabham.[o] He purchased many old Madeira wines, including a famous 1792–1840 (vintage-bottling years). According to his son, 'this 1792–1840 never had any connection to Napoleon' (Croft-Cooke 1961). Since Napoleon was the most famous person in the world in 1815, one would expect numerous local accounts of a story linking him to Madeira wines. But there is no contemporary account. There is also no record of a ship arriving in Funchal from Santa Helena in 1822 (Liddell 1998). The 'Napoleon-Madeira' connection was first printed in the *Daily Telegraph* on 8 October 1941. However, bottles of '1792–1840 Blandy Madeira' and 'Blandy's Extra Reserve - Solera 1792' did exist – without mention of a grape. Sir Winston Churchill tasted the '1792–1840' during his vacation in Madeira in 1950. But its connection to Napoleon was made up.

From 1800 to 1815, the demand for Madeira wines exceeded the supply and Madeira exported some 15,000 pipes per year, without much competition since many European ports were closed because of the Napoleonic wars. After 1815, trade embargoes disappeared, European ports reopened, and large quantities of wine from France and Spain flooded the European and colonial markets. The harvest was very poor in 1816, the 'year without summer' caused by the eruption of Mount Tambora (Klingaman and Klingaman 2013). Sales were slow. Madeira exports dropped by two-thirds (Liddell 1998). Much of the 1819 to 1821 harvests went unsold. Some 20,000 pipes awaited a buyer in 1820 (Vieira 1993), and that grew to 40,000 in 1824 (Liddell 1998). Exports to North America dropped from the old 3000–3500 pipes a year to just 150 in 1827. Merchants only bought wine at very low prices. The situation in the Açores mirrored that in Madeira. The large demand characteristic of the late eighteenth and early nineteenth centuries never returned.

Tastes were changing. The annual exports of Madeira to England dropped from ~6000 pipes (before 1815) to ~800 in 1841 (Liddell 1998). George IV (r. 1820–1830) drunk Sherry instead of Madeira, which was hard to get (Vizetelly 1880). The British Factory, founded in 1638, was abolished in 1838. As steam replaced sails, ships no longer had to follow the winds and currents (Figure 6). The Suez canal opened in 1869. This diverted the ships on their way to India and the Far East away from the Atlantic. Yet, almost all the food consumed in Madeira was still imported. For the local population, these were years of pain, tears, and hunger. Thousands emigrated from Madeira to Brazil. And then, things got much worse.

The Road to Modern Ports

The evolution of Douro wines from dry table wines to the long-lasting fortified ruby and tawny Ports we know today lasted several centuries (Bradford 1983; Johnson 1989; Pereira and Almeida 1999; Matheison 1999; Bennett 2001; Phillips 2002; Beazley 2004; Mayson 2019). A summary is as follows.

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The Douro valley is mountainous. In many locations, the river flows through steep ravines. The soil consists of rocky schist which absorbs heat during the day and releases it at night. The summers are very hot, and the winters can be bitterly cold. Before dynamite, terraces had to be carved by hand to accommodate one or two rows of vines. These terraces are critical as they prevent erosion and trap rainwater. The back-breaking work was done by local people and workers from as far away as Galicia.

In the late fourteenth century, most cultivars were white (Alvarelhão, Donzelinho, etc.) with some red grapes growing in the same vineyards and harvested at the same time. The best wines were made with mature grapes and treaded by foot in small stone lagares[p] (Pereira and Almeida 1999). Late-harvest grapes are rich in sugar. Extensive foot treading resulted in deep-red wines with high levels of alcohol. Since the acetic bacteria does not thrive above 16% alcohol or so (Harutyunyan and Malfeito-Ferreira 2022), these wines aged without spoiling, and even improved after four to six years (Fernandes 2001).

Long-lasting and red wines were rare at a time when most wines were white or light red, light, and short-lived. In most wine regions, grapes were normally harvested as soon as they were mature, so that wine could be made and sold. Waiting for the berries to be very ripe was sometimes done in Greek and Roman times but rarely in the Middle Ages. Why take a chance that bad weather will ruin the harvest or that birds will feed on the sweet berries? And then, late harvests result in a smaller crops. Vineyard owners hired tenants to work in the vineyard, and they were paid with one-third to one-half of the wine produced. They wanted to harvest as soon as the berries were ready in order to maximize the volume of wine. Late harvests, as was done along the Douro, were rare.

Since the mid seventeenth century, most Douro wines were commonly fermented dry and then fortified with brandy (Pereira and Almeida 1999). English merchants arrived in the late seventeenth century (Pereira and Almeida 1999): Warre in 1660; Phayre and Bradleys in 1678 (they founded Croft); Job Bearsley in 1692 (his Port House became Taylor, Fladgate and Yeatman), etc. A representative of the Hanseatic league, Cristiano Kopke, founded the Kopke Port House, but its official founding date of 1638 has been questioned since Cristiano was born in 1693 and arrived in Porto in 1709 (Pereira 2023b). The merchants encouraged viticulture along the banks of the Douro and invested in lodges and warehouses in Porto and Vila Nova de Gaia. The wine production grew to over 13,000 pipes by 1693. More English and Portuguese Houses were soon established (a complete list was compiled by Pereira and Almeida, 1999).

Until 1760, the winemakers distilled their own brandy or purchased it wherever they wanted. A serpentine alembic could deliver 50 to 60% alcohol. Brandy distilled from local wine was the best choice, but distilling cheap wines from other regions, or blending good brandy with spirits obtained from other sources, saved money. The quality and strength varied (Bennett 2001). How much brandy to add was up to the winemaker. One *almude* of spirits per pipe of wine was typical in the early days (Pereira and Almeida 1999; Bennett 2001), but some producers added more, much

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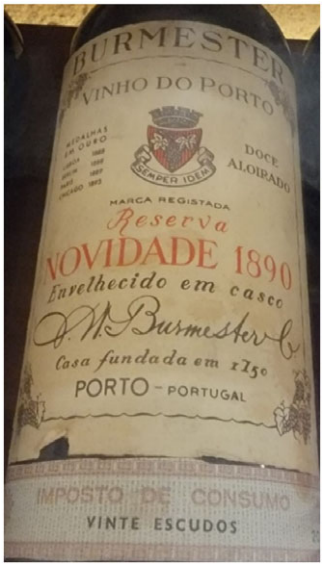

Figure 9. An 1890 Novidade by Burmester at 'Garrafeira Nacional' in Lisbon. If you have to ask how much it costs, you probably cannot afford it (photo SKE).

more. It was also common to add a little more brandy before transportation to Vila Nova de Gaia, where the traders, the shippers, and then the merchants in London also poured a little more. All depended on the quality of the wine and the taste of the customer in England. Some of these 'Ports' must have been awfully strong.

The best wines from the Douro, called *vinhos de feitoria*, were used to make high-end wines for export to England. The lesser wines, *vinhos de ramo*, were consumed locally or shipped to the colonies, especially Brazil (Pereira 2022). Following an exceptional harvest, the Portuguese called their best Douro wines *vinho de Novidade* ('wine of the year') – not easily pronounced in English. The traders used *vintage* instead, referring to high-quality wines of the current vintage year. Despite the insistence of traders, some Ports remained labelled *Novidade* for a long time (Figure 9). But these were not the 'vintage Ports' we know today, which became a strictly-regulated category of Ports in 1932.

As the demand for Port increased, the English traders pressured the growers and winemakers to produce more, stronger, and deeper-coloured wines. More red grapes than white were planted, and the value of the land and quintas increased. But the push for higher production led to cheating: inferior wines – some from outside the region – were blended with the best feitoria ones; fortification was done with lower-quality brandy – sometimes obtained from fermented fruits or grains; elderberries were added to enhance the colour; ginger, pimento, and sugar were used to 'fine-tune' the flavours. And then, merchants and shippers added more brandy to mask the bad flavours. The quality of the wines reaching England decreased, leading to a drop

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in demand, and then in prices. In 1693, Richard Ames wrote 'A Farewel to Wine' which included the verses:

> *. . . But fetch us a pint of any sort,*
> *Navarre, Galicia, anything but Port . . .*

while William Salmon wrote in his 'Compleat English Physician': 'Portoport; it is a very strong-bodied wine, and a great stomatick, but not very palatable, and therefore not so much drunk as other wines'.

By the early 1700s, the English had established a near-monopoly on the Port-wine trade. During the War of Spanish Succession (1701–1714), no French wines could be shipped (directly) to England and imports from Portugal increased, further stimulated by the Methuen treaty. More vineyards were planted along the Douro and its tributaries, further away from Porto. The British merchants set up a 'Factory house' in 1727, similar to the British Factory in Madeira. But the quality was decreasing. The demand and prices fell: in 1728, 21,000 pipes were exported at £16/pipe, and in 1756 only 10,000 pipes were exported, and at £2.10/pipe.

Since wine exports provided much needed foreign currency to the Portuguese treasury, the problem was felt far beyond the Douro region. Something had to be done. The trigger was the 1755 'Lisbon' earthquake and tsunami, followed by the appointment of Sebastião de Carvalho e Melo ('Pombal') as prime minister by José I (see earlier). He promptly decided to strip the English traders in Porto of their power over winemakers and growers, and to strictly regulate Port wines. He also declared that the region had the monopoly of wine sales to Brazil (Pereira 2022). That provided an economic boost, a 'sweetener' to compensate for the massive regulations to come. During the colonial period, Brazil was not allowed to produce its own wine. Now, it only received the *vinhos de ramo* produced in the Douro, and they were sold at much inflated prices. The *vinhos de feitoria* were reserved for export to England.

On 10 September 1756, the *Companhia Geral da Agricultura das Vinhas do Alto Douro* ('Companhia') was created. It was run by a Board (or Administration) and funded by commissions: 2% on wines shipped from Porto, 2% on funds returning to Porto, 2% on sales to Brazil, and 1% on sales within the Porto area (Souza *et al.* 2003). The Companhia's monopoly on the sale of wines for local consumption led to riots by innkeepers in 1757. The riots were brutally suppressed.

The Brazil monopoly, the regulations, and a powerful Companhia which promoted viticulture in the Douro valley, all worked against the interests of the neighbouring wine regions: Minho, Beira, and Trás-os-Montes. They were left behind. In 1774, the custom offices in Caminha, Viana, Esposende, and Vila do Conde were removed: all the wine shipments now had to go through Porto, where Douro wines were heavily favoured (Loureiro *et al.* 2025).

The Companhia's other goals were to guarantee the origin of Alto Douro wines and promote their production and commercialization; to limit the control of this economic activity by the British; to ensure the quality, prevent adulteration,

balance the production and trade, and stabilize the prices. All the elder trees in the Douro were uprooted and burnt. The most common abuses were curbed: sanctions were imposed for importing wines from other areas (for blending), for adding any kind of spice, for blending red and white wines, and so on. Growers could produce red, white, or pink wines, but not both. By 1760, the Companhia also gained a monopoly on the production of the brandy used for fortification. Maximum and minimum prices were set. By 1765, every grower had to deliver a production manifesto within 8 days of harvest. Everything was controlled: planting, production, shipping, sales, etc. The British traders were furious, but there was not much they could do.

The first demarcation of the 'Port' wine region was completed in 1758, with an addendum in 1761. It included 67 parishes and covered some 40,000 ha. The areas allowed to produce Port were limited to rocky vineyards along the Douro and its tributaries: rio Corgo, r. Varosa, r. Távora, and r. Pinhão. The boundaries were marked with 335 stone pillars, the *marcos pombalinos*, paid for by the vineyard owners. '*Feitoria*' was carved on one side to show which high-quality vineyards were within the demarcated zone. Surprisingly (or not?), Pombal's private estate in Oeiras, west of Lisbon, was included. Even though sweet fortified wines were produced there, Oeiras is quite far away from the Douro.

It is often repeated that the 1756 delimitations and the establishment of strict rules were the first such regulations in the history of wine. While this comprehensive package does have unique features, older and more limited delimitations and regulations exist. In 1345, Don Juan Manuel, son of Manuel of Castile and Lord of Villena, issued ordinances regulating the cultivation and commercialization of wine. This included deadlines for harvest, specific aspects of viticulture and wine-making, as well as punishments for stealing vine cuttings or entering a vineyard on horseback between 1 May and harvest time. In 1395, Philip the Bold of Burgundy famously ordered that the highly prolific Gamay cultivar be uprooted and replaced with the Pinot Noir (Berlow 1982). This edict was re-issued periodically. Today, Gamay grows in Beaujolais, but not Burgundy proper. In 1483, the Rules of the Guild of Raisin and Grape Harvesters of Jerez were established, arguably the first 'denomination of origin' in Spain. They defined the characteristics of butts, forbade the storage of wines from different vintage years, and imposed other restrictions (these rules were abolished in 1775). A handbook of wine-making regulations for the Tokaj-Hegyalja wine region of Hungary was published in 1641, followed by delimitations of the region by the Holy Roman Emperor Charles VII in 1737. In 1716, the Grand Duke of Tuscany, Cosimo III de Medici, delimited the regions of Chianti, Pomino, Carmignano, and Val d'Arno di Sopra, and regulated the commerce of quality wines.

The Companhia was not much loved, but the quality of Port wines did increase and the trust in the brand restored. The prices and exports to England rebounded: 31,000 pipes were exported in 1799. Port wines were now often fortified before the end of the fermentation. Everyone used the Companhia's brandy, distilled from

lesser Douro wines. The Port wines stayed in the warehouses in Vila Nova de Gaia for two to three years before shipping, in barrels. This delay allowed the strong taste of brandy to fade away. The word 'vintage' soon referred just to wines from exceptional vintage years. Port became the 'Englishman's drink': a '3-bottle man' was one able to drink three bottles of Port in one sitting.

Importing wine to England in bottles was illegal until 1867. Yet, bottles were available in Porto since the mid 1600s. The early 'onion-shaped' bottles were used to bring wine from the barrel to the table. The shape of the bottles changed in the mid-1700s to the cylindrical shape we know today. It allows the bottle to lay on its side for ageing. Some traders bottled their personal Port wines for that purpose. In England, the merchants also bottled some of their Ports for immediate sale or storage. This marks the beginning of 'bottle-aged' vintage Ports (Warner 1963). In 1768, a Christie's catalogue advertised a bottle of 1765 Vintage Port, the oldest-known example (Pereira and Almeida 1999).

Since bottles were rare and expensive, some Ports were kept in barrels, sometimes for six years or longer. Because of the slow oxidation in barrels, they evolved differently from the same Ports that had been bottled early: the barrel-aged Ports gained a golden-brown 'tawny' colour and became softer, more 'nutty', while the bottle-aged Ports kept the bright red 'ruby' colour and remained sharp. Valente-Perfeito (1948) wrote about Novidade Port bottled late:

> the must is the same as for Novidade. Simply, instead of being bottled 2–3 years after the vintage, it spends 6, 7, and sometimes more time in wood. It has a charm of its own that comes from the noble elegance of the tawny allied with the virility of the vintage.

Soon, one could purchase 'bottle-aged vintage Ports' or 'barrel-aged vintage Ports'. The vintaged tawny Ports would later be called *Colheitas*.

José I died in 1777 and was succeeded by his daughter Maria I (r. 1777–1816). Pombal had made many enemies and quickly lost favour. He ended up in internal exile and died a few years later. Many of his reforms were undone or no longer enforced. The Companhia lost some of its privileges. Maria authorized the export of any Portuguese wines to Brazil. But the sales of Port wines to England remained strong, and a Russian market emerged in 1779 (via contacts in London). By 1781, Porto had trade relations with Saint Petersburg and the Baltic States.

From 1788 to 1793, the Douro demarcated area was increased to include 87 parishes. Maria's demarcation stopped near Cachão da Valeira where waterfalls prevented navigation on the Douro. This obstacle was eventually removed at considerable expense. That was paid for by a special tax on wine, brandy, and vinegar shipped on the Douro. Now the river was navigable all the way to the Spanish border. Yet, the Douro Superior region, far away from Porto, would only be demarcated in 1907. In 1799, a record 100,000 pipes of vintage Port were exported to England. That was about half of all the Portuguese exports.

And then Napoleon seized power in France. He wanted to blockade England, but its old ally Portugal refused to stop the trade. Napoleon sent French (and Spanish)

troops into Portugal. The King and his court fled to Brazil but the Portuguese people resisted with English help under Wellesley. Part of the cost of the war was paid by a special tax of 600 reis per pipe of Port exported. In the Douro valley, little damage was done to the vineyards: the steep terrain made it easy for the Portuguese to stage guerilla attacks and difficult for the French troops to respond (Gates 2001; Phillips 2002). But in Porto and Vila Nova de Gaia, the French looted the Port warehouses. The financial loss was substantial. Most English merchants left the city, but 11 of them stayed and founded the British Club. After Napoleon's exile to Santa Helena, life for English merchants returned to normal, and the mandate of the Companhia was extended for 20 years.

In the first edition of his 'Topographie', Jullien (1816) wrote (I paraphrase):

> The best vines grow low to the ground. After a longer maceration, 1/12th (by volume) of strong brandy is added. Three years after harvest, the wine is shipped to Peso da Régua, where the Companhia purchases it at a fixed low price, and then the wine is shipped to Porto, sold to traders who ship it to England. The Company keeps 6% of the profits. The lesser wines are shipped to the colonies, and some of them are very good. White wines are never exported.

Jullien made no mention of 'vintage' or 'novidade'.

When João VI returned from Brazil, he reduced many privileges and responsibilities of the hated Companhia. In particular, winemakers were now allowed to distil their own brandy. But then came the War of the Two Brothers, Miguel and Pedro (see earlier). During their siege of Porto, the Miguelists were in Vila Nova de Gaia, across the Douro river from Porto. They set fire to Port warehouses, leading to the loss of some 27,000 pipes of Port (Bradford 1983). In the end, Pedro won – with English help. He ended the privileges of Companhia, which became the *Companhia dos Vinhos do Porto*, a commercial entity with no special powers. But in 1838, its powers were restored for 20 years.

By that time, the unwritten rule was to produce 'vintage' Port only after an exceptional harvest. Many issues related to the fortification had yet to be resolved. Quinta do Roeda increased the amount of brandy it used to some 3 almudes per pipe, while José Bernardo Ferreira did not fortify at all, and his daughter Antónia Adelaide instructed the manager at Quinta do Vesúvio not to fortify before the end of the fermentation (Pereira and Almeida 1999). Fonseca argued that only weak wines should be fortified, after the fermentation was complete.

In the 1866 edition of the 'Topographie', Jullien notes that the wines no longer had to be sold to the Companhia: that obligation was suppressed by Royal Decree in 1852. Instead, there was a three-day market for new wines every March or April in Peso da Régua. The quality control was done by a committee of tasters in Porto. Half of them were growers, half shippers, and the committee was chaired by the director of customs. All the wines in the delimited area were tasted, and the best ones selected for export. Each pipe of selected wine was given a permit for transport from the wine-producing area to Porto or Vila Nova de Gaia, and then shipping to

England. Jullien wrote of an active black market where the permits could be purchased.

In the middle of the nineteenth century, the Scot James Joseph Forrester had become a larger-than-life personality in the region (Shepherd 2020). He was one of the very few foreigners to travel deep into the Douro valley, in his specially-equipped *barco rabelo* (small cargo boat used to transport Port pipes on the river). At that time, there were no accommodations, the few roads were rough, and bandits made travel dangerous. Forrester drew the first detailed maps of the Douro, from the Spanish border to the Atlantic. For this effort, he was made a Baron. In 1844, he published (in London and Porto) the pamphlet *A Word or Two about Port Wine*, in which he strongly criticized some wine-making practices, including fortification. Forrester believed that Port should be made using traditional methods: long foot-treading until the end of the fermentation, resulting in a dry wine (no residual sugar), without fortification. He took issues with the *Companhia*, its tasters, and the all-too-common bribes they accepted (Bradford 1983). These bribes had allowed some officials to build impressive *quintas* in the Douro (Shepherd 2020). He later documented the impact of powdery mildew (see next section) and pioneered the use of sulphur. Tragically, he drowned in the Valeira rapids in 1861.

Disasters and Slow Recovery

Vitis Vinifera is the only grapevine native to the Near-East and Europe. It produces quality wine but is vulnerable to fungal infestations and its roots have no defence against phylloxera. There are about a dozen species of grapevine native to North America: *V. Labrusca*, *V. Rupestris*, *V. Riparia*, and so on. They resist local fungi and pests, but their wines have unpleasant flavours (Redding 1833). The trans-Atlantic trade substantially increased in the nineteenth century, including native-American vines that Europeans experimented with. Hence, it was only a matter of time before the American threats to *V. Vinifera* would arrive in Europe. When they did, disaster struck: winemakers were totally unaware of what they were and how to fight them.

The first was oïdium (powdery mildew). It is a fungus that spreads on the leaves, flowers, shoots, and fruits. The attacked berries dry, fail to ripen, and contribute bitter flavours to the wine. Oïdium was first reported near Canterbury in 1845 (Martin 2009). By 1851, it was all over France and moving south. The remedy was found a long three years later: sulphur-lime fungicides. It took time for the details to reach all the growers: how to mix the chemicals, when and how often to spray, and so on. Some growers were also slow to implement this treatment because of the cost of the chemicals and the practical difficulty of spraying them. If rain washed away the fungicide, more treatments were required. Over time, it was realized the sulphur-lime mixture is best applied as a preventive measure in the spring, early morning or late afternoon. Once a vineyard was infected, oïdium was difficult to eradicate. Oïdium became endemic and spraying continues to this day.

The next threat to viticulture was even more serious. Phylloxera, from the Greek φύλλον (leaf) and ξηρός (dry), is a tiny aphid that feeds on the roots and sap of *V. Vinifera*, starving the vine within a few years. Its life cycle is complex, part above and part below ground, which is where it does the most damage and is difficult to reach. Phylloxera often travels with the dirt attached to shoes, or on agricultural tools. It devastated viticulture world-wide. It is less active in soils that contain fine sand or high concentrations of metals. In France, the infestation was first noticed in the 1860s along the Rhône and spread from there. In Portugal, it started at about the same time at Quinta dos Montes in Gouvinhas, not far from Peso da Régua (Mayson 2019). In both cases, it is believed that the insect arrived on the roots of American vines imported for viticultural experimentation (Pereira 2022). France switched from being the largest exporter of wine in the world to the largest importer (Pinilla and Serrano 2008; Pinilla 2014). Most of that wine came from Rioja in Spain, some came from Italy, Portugal and, a few years later, a lot from Algeria (Estreicher 2023).

Downy mildew arrived in the south of France in 1878 but hit the Douro valley 15 years later and Madeira in 1912. This fungus attacks the shoots, leaves, fruits, as well as the woody parts of the vine. If left untreated, it kills the vine. But the solution was accidentally found shortly after the infestation began: the vines growing near a pedestrian path at Château Ducru-Beaucaillou (in Saint-Julien, Médoc) had been sprayed with a blueish copper sulphate-lime blend to discourage passers-by from stealing clusters of grapes. These vines were not attacked by mildew. The key ingredient is copper. The fungicide was quickly fine-tuned and became known as the Bordeaux mixture (*bouillie Bordelaise*). It is still used today. Downy mildew caused less devastation than oïdium because wine growers were already familiar with spraying and the chemical composition was found early.

Oïdium was spotted near Peso da Régua in 1848 (Mayson 2020). From there, it spread to the entire Douro valley and the rest of Portugal (Mayson 2020). Barraida was hit in 1851, but the Baga grape offered decent resistance to it. Alentejo, Carcavelos, and Dão were devastated. Dão's economy depended almost exclusively on viticulture. In the Vinho Verde region, the low-lying vines were destroyed by oïdium, but the vines trained high above ground suffered less. The very dry Douro Superior was less affected. The exports of Ports remained strong because the stocks were high, but the production plummeted, many vines died, and the growers suffered. Some small owners had no choice but to abandon their vineyards. Properties changed hands (Pereira 2022): Warre acquired Quinta do Bonfim, Taylor bought Quinta de Vargelas, Graham purchased Quinta dos Malvedos, Offley-Forrester got Boavista, and so on. Spraying with sulphur-lime fungicide begun in the mid-1850s. The spraying was done with hand-held sprayers, often by women walking from vine to vine on the steep, rocky terrain (Pereira and Pereira 2022). Because of the crisis, the Companhia lost most of its privileges and a weaker Regulatory Commission on the Agriculture and Trade of Alto Douro wines was created (Pereira 2022). Brandy could again be distilled by the producers, but there was little wine to distil. Other fermented fruits and grains were used, and the resulting brandy was sometimes mixed with industrial alcohol. In 1897, Sandeman ran out of brandy and

fortified Ports with scotch whiskey. But spraying was effective and by the mid-1860s, many vineyards were recovering.

The Atlantic islands suffered the most from oïdium, not just because their economy relied almost entirely on wine, but also because the warm and humid environments were ideal conditions for the propagation of moulds, fungi, and insects. In Madeira, oïdium appeared in 1851. Locally, it was called 'mangra' (Liddell 1998) or 'mangara' (Cossart 1984; Mayson 2022). All the cultivars were infected, but oïdium hit the sweet Malmsey and Boal grapes with more ferocity. In three years, the devastation was nearly complete. The production dropped from the pre-oïdium annual average of 12,000 pipes to 1,913 in 1852, 717 in 1853, 143 in 1854, and just 36 in 1855 (Liddell 1998). Many British firms left Funchal. The number of shippers dropped from 70 in 1850 to 15 in 1855 (Cossart 1984). Their stocks were purchased at bargain prices by the shippers who stayed, such as Charles Blandy or Cossart, Gordon & Co. The Krohn brothers also stayed: they had a monopoly on the Madeira shipments to the court of Russia.

The remaining shippers now had odd collections of wines from various cultivars and vintage years, some of them in small amounts. Using the usual 'vintage' indication on bottles or pipes became impractical. The shippers switched to a solera system which allowed them to use the stocks efficiently while maintaining a high level of quality. It differs from the solera system used for sherries.

A Spanish Sherry solera consist of three to eight rows of barrels. The solera proper is the bottom row, which lays on the ground: *solum* in Latin, hence 'solera'. The row of barrels immediately above is the first criadera ('nursery'), the row above that is the second criadera, etc. When wine is taken out from the solera, these barrels are filled up with wine from the first criadera, which is then topped with wine from the second criadera, and so on. The new wine goes into the uppermost row of barrels. This method always blends newer wines with older ones, thus providing nutrients to the famous flor – the thin layer of special yeasts that develops on the surface of the (manzanilla, fino, amontillado, or palo cortado) sherry. Normally, no year is specified on the bottles. And when a sherry label does mention a year, it normally refers to the year when the solera was started. A Sherry solera can last many decades.

A Madeira solera starts with a special vintage wine, the precious 'core'. When some of the wine is bottled, a 'comparable' wine is added to the pipe to fill it up. Finding a comparable wine is an art form, but all the bottles from a specific solera normally taste very much the same, year after year. All of them contain a little bit of the core wine. The year on the label is a vintage year: that of the core of the solera. A Madeira solera ends when no more 'comparable' wine can be found.

Facing starvation during the oïdium crisis, almost half of the population of Madeira emigrated, mostly to Brazil (Mayson 2022). Those who stayed received some international help: ships carrying basic necessities (food, clothing, blankets, etc.) arrived from London and several North American harbours (Charleston, Savannah, Boston, New York: see Figure 10). Even Ireland contributed, despite being greatly affected by the potato famine at the time. Efforts were made to diversify agriculture. Some of the abandoned vineyards were planted with sugar cane, others

Figure 10. Ten-year-old Madeira wines celebrating the style popular in various North American destinations before the arrival of oïdium (photo: SKE).

with coffee, or tropical fruits. In the fall of 1852, the Portuguese government helped by funding the first proper road on the island, connecting Funchal to Câmara de Lobos. The 'Estrada Monumental' provided 300 men with work for 12 months (Cossart 1984). And then women to took the initiative. Under the leadership of Elizabeth Phelps, the wives of unemployed workers learned the art of embroidery. They became very skilled at it: within ten years, a British firm was handling the exports. By 1923, the embroidery industry employed some 70,000 workers (Liddell 1998).

Spraying with sulphur-lime fungicides slowly restored the vineyards. Some cultivars had almost disappeared (Terrantez) while oïdium-resistant direct producers such as the Isabella had become ubiquitous. The Isabella is a prolific American-European (*V. Labrusca* × *V. Vinifera*) hybrid. Its wine has a pronounced 'foxy' flavour, not found in pure *V. Vinifera* wines. Even though some local consumers got used to it, this was not a wine for export. Yet, for a while, much of the Madeira involved blends of Isabella and Tinta Negra and so on. The reputation of Madeira suffered. As oïdium treatment allowed more vineyards to recover, the onset of the US Civil War (1861–1865) marked the end of the very important North-American market. In the late 1860s, most Madeira wines were shipped to England, India and Russia.

As bad as oïdium was in Madeira, the situation in the Açores was worse. Because of the strong Atlantic winds, the vines are not trained on wires or stakes, but always

grow very close to the ground in their individual *currais* (Figure 8). The moisture is always high. This configuration made it impossible to spray fungicide efficiently. And then the frequent rains washed away the fungicide, forcing growers to spray over and over again. The cost was more than the value of the wine. There was no solution. Viticulture on São Jorge island was abandoned. By 1853, Pico was devastated, resulting in misery, hunger, and then emigration. Its population – about 28,000 before oïdium – has yet to recover: it is only about 18,000 today. The abundant Verdelho went almost extinct, the famous passado wine disappeared, etc. The only option was to plant hybrids which offered some resistance to oïdium: the Isabella of course, but also the Herbemont, Seibel, and others. A few precious patches with the original Açores cultivars remained here and there.

In Vinho Verde, little or no sulphur treatment was used: it was impractical for the vulnerable low-lying vines as well as for the better-protected vines growing high on trellises (Loureiro *et al*. 2025). More early-harvest 'verde' wine was produced. Several direct producers were planted, in particular the Isabella and Jacquez (*V. Berlandieri* × *V. Vinifera*).

And then phylloxera arrived. In the Douro, the infestation began in 1863 at Quinta dos Montes (Cima Corgo). The production of the estate dropped to 38 pipes in 1875 and 0 in 1879 (Bradford 1983). Phylloxera reached Baixa Corgo and the Douro Superior within a few years. And then, it spread to all of Portugal: Dão in 1881, Bairrada in 1883, and so on. Every imaginable remedy and spray was tried but nothing worked. The most efficient method was to inject carbon disulphide (CS_2) directly into the root area of each vine (Figure 11). This nasty insecticide killed the aphid, but new ones arrived a few weeks later.

Phylloxera marked the end of the Companhia (1866). The strict rules governing the production of Port wines no longer applied. Wines could be freely exported, but the production took a nosedive. Since wines of the desirable quality were in short supply, dubious winemaking and marketing practices returned. Cheaper wines produced outside the Douro valley were again imported, blended, and sold as Port (Pereira 2022). By 1872, many vineyards and quintas were for sale. Nonetheless, construction began on a railway line: it linked Porto to Peso da Régua in 1878, Pinhão in 1879, and Barca de Alva in 1887 (Pereira 2022). This resulted in increased planting in the Douro Superior.

It was known that some American vines such as *V. Riparia* or *V. Rupestris* are resistant to phylloxera, but the wines they (and their hybrids) produce have peculiar flavours and are no substitute for *V. Vinifera* wines. By the late 1870s, it was realized that the solution was to graft *V. Vinifera* cultivars onto phylloxera-resistant American rootstock. Growers feared that the unwanted flavours of the native-American vines would affect the wine, but the genes responsible for the fruit are in the scion, not the roots. Grafting impacts the vine in other ways: the vigour of the plant, the time when buds and flowers appear, and when the fruit develops. The rootstock must also be compatible with the terroir and the specific graft. The best rootstock was often obtained by first hybridizing an American vine with a specific *V. Vinifera* cultivar. However, following the oïdium disaster, the Portuguese

Figure 11. Maria Pinheiro da Veiga shows the tool used to inject CS_2 deep into the root area of a vine to kill phylloxera. Her great-great-grandfather Joaquim Pinheiro de Azevedo Leite Pereira, 10th Lord of Casa do Santo, initiated the fight against phylloxera and became known as the 'saviour of the Douro' (photo: SKE).

government had made it illegal to import any American vine. The ban was lifted in 1883, when bureaucrats realized that the vines that brought the problem were also part of the cure.

In Estremadura, the Visconde de Chanceleiros is credited (Mayson 2020) with introducing the first American phylloxera-resistant rootstock in Portugal. That happened in the late 1870s and most likely involved illegally-imported cuttings. The first such rootstock in the Douro was used shortly later at Quinta da Boa Vista. Nurseries were established in 1883 and replanting began a few years later.

That was the solution, but every single vine had to be replaced. Pulling out vines without heavy machinery is slow, hard work. Pulling out thousands of your own vines is gut-wrenching. And then one must identify the appropriate rootstock, wait for roots to develop, graft the proper cultivars (Figure 12), and wait again until the first good grapes can be harvested. This takes years and is financially devastating. Many small growers simply walked away. Some of the abandoned terraces are still visible in the Douro today: the *mortórios*. But the replanting involved important improvements: carefully selected cultivars, deeper ploughing, wider terraces, regular rows of vines trained along metal wires, higher and sturdier walls, and so on (Pereira 2022).

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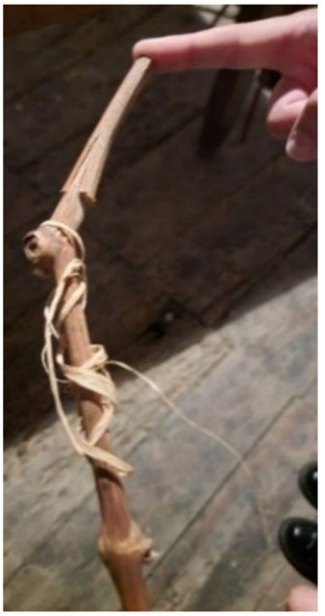

Figure 12. The grafted *V. Vinifera* cultivar (held with a finger) will be secured in place on the American rootstock (vertical branch) with a natural fibre (photo: SKE).

In Madeira, phylloxera arrived in Funchal and Câmara de Lobos in 1872, probably on the roots of imported Isabella vines that had good resistance to oïdium (Cossart 1984; Liddell 1998). At that time, some 2500 ha of vineyards had just recovered from oïdium (Croft-Cooke 1961). About two-thirds of the vineyards were planted with Verdelho, much of the rest was Tinta Negra. There was some Listrão and Maroto, but the Sercial and Boal were rare, the Bastardo and Terrantez very rare. Some Malvasia remained. The best, Malvasia Cândida, survived only in the Fajã dos Padres vineyard.

Henry Vizetelly (1880) visited the island in 1877 and noted that Thomas Slapp Leacock was rescuing the traditional Madeira cultivars in his St John's vineyard. He treated the roots with resin and chemicals such as essence of turpentine. Leacock's approach worked but his technique could obviously only be used on a very small scale. Yet, he saved enough vines for later grafting.

Overcoming phylloxera took more than a decade, and the government prohibition on imports of American vines delayed the replanting. Many hybrids were planted. Two nurseries near Funchal tested a wide range of rootstocks. By the time the vineyards were grafted, the Bastardo was gone, and just one vineyard planted with Terrantez remained. But the recovery was under way. Some 6000 pipes were produced in 1896. The North American market was no more, but Scandinavian countries were buying Madeira.

In Açores, phylloxera arrived in the early 1880s. It killed most of the vines that had survived oïdium. The remaining vineyards were planted with hybrids: Isabella,

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Figure 13. The 2.4 ha Nacional vineyard at Quinta do Noval has own-rooted Touriga Nacional, Touriga Franca, Tinta Cão, and Souzão vines. Nobody knows why phylloxera is not active there (photo SKE).

Herbemont, Seibel, etc. Distillation continued, but with fermented figs and (pitted) peaches. Downy mildew had few vines to attack, but another fungal disease, grape anthracnose, did additional damage.

Today, almost all the *V. Vinifera* vines in the world are grafted onto American rootstock. Exceptions include the vineyards of Chile and Santorini (Greece). In Champagne, Bollinger's *Vieilles Vignes Francaises* blanc de noir is made from self-rooted Pinot Noir grapes. In Touraine, Marionnet produces the white *Provignage* from pre-phylloxera Romorantin vines. In Galicia, several Albariño vineyards in Rías Baixas are not grafted. Wine from ungrafted Portuguese grapes is made in the sandy soils of Colares (north-west of Lisbon) and Porto Santo (Madeira). In the Douro, the small Quinta do Noval 'Nacional' vineyard has own-rooted vines (Figure 13). In the years when a vintage is declared, only 200 to 250 cases of it are produced.

The worst century viticulture ever faced began with the arrival of oidium around 1850 and lasted until after the Second World War. Oïdium devastated vineyards, and then phylloxera inexorably destroyed the vines themselves. By the late nineteenth century, some vineyards had disappeared, others were planted with ungrafted American vines and/or hybrids. Replanting with high-quality grafted *V. Vinifera* cultivars was slow.[q] Many countries experienced economic difficulties, high inflation, and/or economic recession. Portugal was one of them. Then came the First World War, the Russian Revolution, the Great Recession, Prohibition, and the Second World War.

During these exasperating decades, winemakers struggled. As prices were low, they compensated by increasing volumes. Starting in the late 1800s, cheating occurred everywhere: France, Italy, Spain, Portugal, etc. Most commonly, cheap

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wines imported into well-known regions were blended with local wines, and the result mislabelled as the real thing. The quality suffered, consumers refused to pay much, which in turn pushed prices down: the familiar downward spiral. Those who wanted to produce high-quality wine found it impossible to compete. Somehow, the buyers had to regain confidence in the quality and origin of the product. This implied strict, enforceable, and global regulations.

The effort started with international conventions on denominations of origin (Paris, in 1883) and false or misleading indications of provenance (Madrid, in 1891). The goal was to protect the geographical designations of origin independently from the commercial brands. These meetings were followed by the 1911 Washington, DC conference on industrial property copyrights, and the 1958 Lisbon Agreement (revised in 1967, 1979, and 2015) which provided for the international protection of appellations of origin and geographical indications. But the first steps were made in the late nineteenth century in Paris and Madrid. They triggered new legislations aimed at defining areas of production and establishing production rules.

In Portugal, this occurred during the short dictatorship (1907–1908) of João Franco, prime minister of Carlos I (Liddell 1998; Loureiro 2024). The regulations related to wine-making practices, imports of wine and spirits, sales, stocks, and also fixed the alcohol content of fortified wines. The Douro was re-demarcated, and 14 Portuguese wine regions were created, seven of which were regulated: Bucelas, Carcavelos, Colares, Dão, Douro, Moscatel de Setúbal, Madeira, and Vinho Verde. These regions were 'closed': no wine from outside could be sold there, unless bottled. Viticulture commissions in the Douro and Madeira were established to register production declarations, control exports, and certify the origin of wines and spirits.

In the Entre Douro e Minho region, a crisp early-harvest wine with low alcohol content and high acidity was produced: *vinho verde*. These wines were made from incompletely ripe grapes and had 7–11% alcohol. The earliest mention of this wine coincided with the arrival of maize in northern Portugal. It displaced the traditional millet in the late seventeenth century (Loureiro *et al.* 2025). The vinho verde regulations of 1926 defined the hanging or trellised red wines from indigenous Minho cultivars. The regulations specifically excluded American hybrids and wines from low-lying vines. Today, only the white vinho verde wines are exported, but the red ones are sold locally and are well worth the visit.

The International Wine Office was created in Paris in 1924 (and ratified in 1927). This occurred after the First World War, during the years when alcohol sales were restricted or even prohibited in many countries. In 1958, this Office became the *Office International de la Vigne et du Vin*. In France (Estreicher 2023), these efforts evolved into a coherent *Appellation d'Origine Controlée* (AOC[r]) system which influenced other countries, including Portugal.

After the Second World War, viticulture improved substantially in Western Europe. Typical post-phylloxera re-planting involved selected vines growing in straight rows and supported with metallic wires. The old mixed-cultivars randomly-planted vineyards were gone. Mechanization and technological improvements modernized the work: straddle tractors replaced much of the manual labour in the

vineyard, trucks promptly delivered the harvested grapes to mechanical presses, the must was fermented in temperature-controlled vats, and so on. But not all countries or regions benefited from such progress: money, a lot of money, was needed. Establishing cooperatives helped: equipment and expertise could be shared, and the quality of wines improved. But investors rarely risked their money in countries run by a dictator. Progress was delayed in Spain (under Franco) and Portugal (under Salazar).

As a result, most Portuguese wines were perceived to be of low quality and sold at comparatively low prices. Port wines were in a category of their own, but imitation Ports were produced in Spain, California, Australia, South Africa, and so on. The need to enhance the quality of the wine, especially for export, led to regulations and incentives that played out differently in different regions.

Douro: in the early 1900s, in order to increase the volume of sales, some shippers still imported wine from outside the demarcated area, blended it with local wines, and then shipped that as Port. This was of course known to the local producers, and their anger was growing. On 1 May 1906, hundreds of them invaded the railway warehouse at Covelinhas (the train station in Peso da Régua) and blew up the counterfeit wine barrels with dynamite (Pereira 2022).

During the 1907/8 dictatorship of João Franco, the Port wine demarcation was extended to be almost identical to today's. The demarcated area had the exclusive right to produce Port wine. New planting and vinification methods were established. All the Port wines had to be warehoused in Vila Nova de Gaia and the exports of Ports had to originate from one of them. This greatly facilitated the supervision and minimized counterfeiting. These rules were strictly enforced until the assassination of Carlos I, in February 1908. Exports were down during the First World War, but then the demand sharply increased. This led to renewed cheating by shippers. Again, violent demonstration by growers and producers took place against the import of wine from outside the demarcated region into Vila Nova de Gaia.

The *Gaia Entreposto* rule was again strictly enforced after 1926, during the military dictatorship, and direct exports from the Douro no longer occurred. The mandate for all Ports to be warehoused in Vila Nova de Gaia lasted until 1964. Port wines started to be exported in bottles to Brazil, then to the USA, and finally to England. 'Vintage' Ports – a category not yet formally defined or regulated – was reserved for wines produced in the best vineyards and best vintage years. But that was still decided by the individual shippers. In the mid-1920s, over 100,000 pipes of Port a year were exported.

Starting in 1928, all Port wines had to have a Certificate of Origin. The year 1931 is one to remember for two reasons. It was the first year when Quinta do Noval produced a vintage exclusively from the own-rooted 'Nacional' vineyard (Figure 13). It is also the year of Niepoort's first Garrafeira[8] Port (Figure 14). This Port spends less than a decade in barrels (the number of years varies), then several decades in large glass demi-johns, and is finally decanted into regular bottles and labelled. In the late 1920s, the grandfather of Dirk Niepoort had purchased 4000 demi-johns in Germany: they had originally been manufactured for holding pharmaceuticals, but

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Figure 14. An empty demi-john (left) and a full bottle (right) of 1931 Garrafeira. The small '1938' on the left of the logo is when the wine was transferred into demi-johns, and 'decanted 1979' refers to the bottling (photos: SKE).

never used. He thought they would be the ideal containers to age his Ports without the considerable loss caused by evaporation. This unique style of Port, only produced by Niepoort, combines barrel- and bottle-aging.

Soon after Salazar took power, the *Casa do Douro* changed from a professional self□regulatory association of winegrowers to a compulsory association of all winegrowers of the demarcated region. The *Gremio dos Exportadores de Vinho do Porto*, or guild of exporters, supervised all the aspects of exports and shipping. On top of them was the newly created *Instituto do Vinho do Porto* (IVP) which supervised everything. It appointed the *Comissão de Viticultura do Douro*, which defined 'vintage' as an exceptional Port from a single vintage year, aged at least 18 months in Vila Nova de Gaia before shipping. The words 'ruby' (a bright-red bottle-aged Port which spent less than 6 years in wood) and 'tawny' (a Port which spent more than 6 years in wood) were defined. Blended tawny Ports with indication of age were formally introduced: 10, 20, 30, and over-40 years.

In 1932, 12 criteria were defined in order to assign a grade, from A to F, to every vineyard in the demarcated region. The A-graded vineyards could turn their entire harvest into Port, and the F-graded ones could produce no Port at all. The criteria included the altitude above the Douro river (lower is better), slope (steeper is best), exposure (south-facing is best), protection from the dominant winds, soil (shales are better than granite, very rocky is best), cultivars (type, age, and density), etc. The registration and grading of all the vineyard lasted until 1945.

In 1934, the IVP appointed a Chamber of Tasters and an Advisory Board of Tasters. Tasting every wine produced within the demarcated area became an

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essential component of quality control. The shippers were no longer involved in deciding if a Port was 'vintage' or not. In 1936, the minimum and maximum quantities that could be shipped by each firm were fixed. In addition to fortified Port wines, the production of table wines with the 'Douro' denomination of origin was created. In 1941, seals of guarantee became mandatory on each bottle, and the wording on wine labels had to be approved.

These new rules affected the shippers. In the past, they could purchase wine at the price they wanted, decide for themselves how to label it (vintage or not), how much to ship, etc. All that flexibility was gone. Many shippers left. The number of firms dropped from 113 in 1935 to 79 in 1944 (Pereira and Almeida 1999).

After the Second World War, the British market declined and larger volumes of Ports were shipped to France, Belgium, Luxembourg, and the Netherlands (Câmara 2023). The consumption within Portugal also increased. In 1946, an IVP publication advertised a sale of old Port wines in three categories: Novidade aged in bottles, Novidade aged in barrels, and cellar wines. This was the last official use of 'Novidade'. The first dam on Douro, the Carrapatelo dam, was built from 1964 to 1971: there would be no more pipes transported down the river on the old barcos rabelos. Trucks had to be used.

In 1973, the IVP formally defined and regulated special Port wines (updated in 2022).

Ruby Ports

Vintage are blends of the best wines of an exceptional vintage year from two or more vineyards (exception: the single-vineyard Nacional). They spend two years in wood before bottling. Declaring a vintage is an important decision for the producer, and does not occur every year. *Single-quinta vintage* are vintage Ports from just one vineyard. They are often made in years when a vintage is not officially declared. *Late-Bottled Vintage* (LBV) wines spend four to six years in wood before bottling. The best ones are marked 'traditional' or 'unfiltered': they keep aging in bottles. *Crusted* Ports are blends of unfiltered vintage Ports.

Tawny Ports

The *Colheita* is a single-vintage Port with more (often a lot more) than seven years in wood. Then 'over-40', '30', '20', and '10' year old tawnies are blends of Ports from various vintage years. The number indicated does not mean that the average age is exactly that. The important factor is consistency: A '10-year-old' tawny by Kopke should always taste the same. As for Niepoort's *Garrafeira*, it is classified as a tawny but really belongs to a category of its own.

Madeira

In the early twentieth century, only about 20% of the vines were high-quality grafted *V. Vinifera* grapes. Most were direct producers, hybrids, and the productive but lower-quality Tinta Negra (Cossart 1984). Blended Madeira wines were commonly

considered to be cooking wines. The old high-quality vintages and soleras existed but there were few of those.

In 1913, three Madeira firms (Hinton & Sons, Welsh & Cunha, and Henriques, Camara, & Co) formed the Madeira Wine Association Company, a private company designed to share production costs and increase global exposure. During the First World War, exports peaked at just over 11,000 pipes (in 1916), but then the Russian market disappeared because of the Revolution. There was a brief boom at the end of the war with almost 20,000 pipes exported (Liddell 1998), but then the global economy declined, the USA imposed a strict Prohibition, and the Great Depression started.

In 1925, under the leaderships of Blandy, Leacock, and Mullins, the Madeira Wine Association Company became the 13-member Madeira Wine Association. It grew to 28 British and Portuguese firms in 1934. They standardized the production of Madeira, the blending was made from common stock, and the accepted styles of Madeira were established. Only the vintage and solera wines remained characteristic of individual shippers. The Association evolved into today's Madeira Wine Company.

The Salazar regime imposed strict regulations. The *Federação dos Vinicultores do Centro e Sul de Portugal* (1933) became the *Junta Nacional do Vinho* (1937) which controlled the production of all Portuguese wines. It established a Delegation in Madeira in 1940. The Madeira Wine Association was ready to interact with it, and later played an important role in the *Appellation Controlée* negotiations (Câmara 2023).

The years of the Second World War were difficult for the wine industry everywhere, including Madeira. Several old styles were abandoned, such as 'London Particular' or 'Old East Indies'. They were replaced with labels which misused the names of famous cultivars: 'Good Companion Bual', 'Duke of Clarence Malmsey', and so on, actually contained no (or very little) Boal or Malmsey (Liddell 1998). The name simply referred to a style of wine: 'Sercial' indicated dry, 'Verdelho' medium, 'Boal' sweet, etc. These wines were shipped in bulk and bottled at their destination. The most important market were the Scandinavian countries.

Just as in Porto, the new regulations on wines and exports resulted in a drop in the number of firms: 119 before the Second World War, 29 in the 1950s, 14 in the 1960s, and 11 before the 1974 Carnation Revolution. Only a few of those handled most of the shipping (Câmara 2023). Cooperatives were established to stock excess production and stabilize the prices, but they were not very successful in Madeira. In 1957, incentives were given to increase planting and grafting traditional high-quality cultivars, which made up only 26% of the total vineyard area. Progress was slow. In 1972, subsidies were offered to land-owners to replace bananas and other crops with high-quality cultivars. Their number increased by 150% within a decade.

Açores

The great pre-oïdium wines were long gone. Much of the production involved direct producers and hybrids which were not exported. Some grafting was done but did not

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solve the persistent problems with oïdium and other moulds. Funding was severely lacking. The renaissance of Açores wines followed Portugal's admission to the European Union.

Modern Portuguese Wines

Background

In the early hours of Thursday, 25 April 1974, the radio played the (forbidden) song *Grândola, Vila Morena*. This was a signal for what would be known as the 'Carnation Revolution' (Léonard 2014b; Rezola 2022), a virtually bloodless coup which toppled Caetano (Salazar's successor) and the Estado Novo. The coup was led by mid-level army officers convinced that Portugal was moving in the wrong direction and that the bloody colonial wars in Angola, Guinea-Bissau, and Mozambique could not be won. The revolution succeeded in less than 24 hours and a provisional government was put in place. Establishing a functioning democracy took longer.

The colonial wars ended and the African colonies became independent. Soon, some 800,000 Portuguese moved from the former colonies back to Portugal, causing major logistical problems. The government nationalized banks, insurances, and other core businesses. It expropriated some 12 million hectares of land that were owned by a few privileged families.

After decades of one-party rule, Portugal now had numerous political parties. In 1975 and 1976, the country voted. Mário Alberto Soares' socialist party came out first, but well short of an absolute majority. Soares started his first term as Prime Minister. For a while, there was considerable political chaos (15 governments in 11 years) and financial difficulties exacerbated by a world-wide oil crisis. Successive governments were formed and collapsed, new elections were held, but the country moved forward. After much debate, a new constitution replaced the Estado Novo. The International Monetary Fund came to the rescue – in exchange for painful austerity measures.

The critical year was 1986: Portugal and Spain joined the European Economic Community. Some €46 billion became available in 1989 (Pedro 2014). Over time, 2000 km of highways, 248 water stations, and 662 schools were built. The literacy rate increased from 67% in 1974 to 90% in 2013. More people purchased cars and drove on the new highways; modern equipment became available for agriculture and viticulture; tourism picked up. Lisbon hosted the 'Expo'98' world fair. Despite all of this, the national debt kept increasing: from 15% of the gross domestic product in 1974 to 128% in 2013. This meant high unemployment and high taxes.

Three more wine regions were demarcated: Trás-os-Montes, Alentejo, and Douro (for table wines). The wine industry modernized with new equipment and up-to-date viticultural and winemaking techniques. The DOC (*Denominação de Origem Controlada*) appellation system was made consistent with European ones. On 1 January 1986, a new central organization became operational: the *Instituto da Vinha e do Vinho* (IVV). It provides the legal framework, coordinates with

European policies, regulates at the national and regional level, and supervises the entire Portuguese wine sector.

The wines from the Douro, Madeira, Açores, and even Vinho Verde had been internationally known for centuries. Far less was known about other Portuguese wine regions. They were producing quality wines: the problem was often transport. Because of poor infrastructure (no roads or easily accessible waterways), some deserving wines could not reach a harbour economically. For centuries, the successful wine regions were located near a harbour (e.g., the Lisbon area and wines from the Tagus, or Porto and wines from the Douro) or along important shipping routes (e.g., Madeira). Before modern roads, railways, and/or canals, overland transport was expensive. Several Portuguese wine regions first appeared on world markets late in the twentieth century. Now though, the needed infrastructure was in place and these wines moved from relative obscurity to world-wide fame. It is now common to see articles in wine magazines such as the Wine Spectator and books such as Mayson (2020) discussing the wide range of Portuguese wines and cultivars. There is indeed a lot to discover in this amazing wine country.

The Wine Regions of Portugal

The highest-ranked wine-producing areas now have a specific DOP (*Denominação de Origem Protegida*), which comes with the strictest regulations. Then come the regional IGP (*Indicação Geográfica Protegida*) labels, and finally there are regional and table wines. Note that one discovers amazing wines under one of the lesser classifications, sometimes by choice, sometimes because the vineyard happens to be in the wrong location.

The IVV list of authorized cultivars includes 151 white, 21 rosé, and 173 red, for a total of 345. Some of these cultivars originate from Spain, France, Italy, Austria, etc. Portugal has approximately 250 indigenous cultivars, about 100 of which have been carefully described more than a century ago (Cincinnato da Costa 1900). This number testifies to the antiquity of Portuguese wines. However, it is only half as many as in the Republic of Georgia where wine has been produced for over 8000 years (Estreicher 2019). Some cultivars have different names in different regions or countries. For example, the Tinta Roriz (or Aragónez, or Valdepeñas) is the Spanish Tempranillo, and the Jaen is called Mencía in Spain. Sometimes, the same (or very similar) name is used for different cultivars: the Terrantez do Pico is distinct from the Terrantez in Madeira; the Arinto dos Açores is not the same as the Arinto in mainland Portugal. But the Verdelho is the same in Madeira, Pico, and mainland Portugal.

Portugal has 14 wine regions, 12 of them in continental Portugal (Figure 15), plus Madeira and Açores. Each region has a control and certification body such as a CVR (*Comissão Vitivinicola Regional*) supervised by the IVV. Within these regions, 31 viticultural areas have achieved the DOP level. Other vineyards belong to the IGP appellation. The country produced just over 7.5 million hl in 2023. As today's wines are not yet 'history', I restrict myself to brief comments. The percentage of Portugal's

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Figure 15. Twelve of the 14 wine regions of Portugal (Madeira and Açores are not shown). The region names (from the map at https://www.ivv.gov.pt/np4/regioes/) do not all match those listed on the left column of the same page. Map modified by SKE with permission from the IVV

total area under vine and the percentage of the country's total wine production are indicated.

Vinho Verde (13%, 12.2%. DOP: 'Vinho Verde'; IGP: 'Minho') has been exporting wine to England since the thirteenth century from the port of Viana de Castelo (north of Porto). The soil is mostly granite and the nearby Atlantic ocean strongly influences the (rainy) climate. The region is best known for its crisp and aromatic white *vinho verde* (Alvarinho, Loureiro, Trajadura, Arinto, etc.), some are sparkling, and some age nicely. Minho also produces red wines from a dozen cultivars such as the Vinhão, Amaral, Borraçal, or Alvarelhão.

Trás-os-Montes (5%, 1.3%, 'beyond the mountains'. DOP: 'Trás-os-Montes'; IGP: 'Transmontano') is a remote and rugged region separated from the coast by the Marão and Alvão mountains. The climate is continental with very hot and dry summers and bitterly cold winters. The region was first planted in Roman times but was always – and still is – isolated. Many vineyards are old, the yields are low, but the quality is high. A range of cultivars are planted: the white Códega do Larinho, Fernão Pires, Gouveio, Síria, etc. and the red Bastardo, Tinta Gorda, Touriga Nacional, Rufete, Trincadeira, and so on.

Douro (25%, 20.7%. DOPs: 'Porto' and 'Douro'; IGP 'Duriense') is the most famous region of Portugal because of the fortified Port wines. The local governing body is the *Instituto dos Vinhos do Douro e do Porto, I. P*. The region stretches east to west from the Spanish border to about 90 km east of the city of Porto. It is protected

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from Atlantic influence by the Serra do Marão mountains. The sub-regions are *Baixa Corgo* ('below the Corgo', a tributary of the Douro), *Cima Corgo* ('above the Corgo': the 'heart of the Douro'), and the hot and dry *Douro Superior*.

Over 100 cultivars are authorized. The 'big five' in red are the Touriga Nacional, Tinta Roriz (Spanish Tempranillo), Tinta Barroca, Tinto Cão, and Touriga Franca (formerly: Francesa), but many others are excellent: Tinta Amarela (also called Trincadeira), Sousão, Touriga Franca, etc. White cultivars (Arinto, Cercial, Donzelinho branco, Folgazão, Gouveio, Malvasia Fina, Encruzado, etc.) used to make up some 10% of Douro's planting, but their importance is increasing.

Making traditional Port wines involves foot-treading (often with mechanical feet) in large 2-foot (~60 cm) deep stone lagars, to extract tannins, colour, and flavouring compounds. Maceration lasts for two or three days and then 154-proof grape spirit is added to kill the yeast. The result is a wine with 20% alcohol and 9 or 10% residual sugar. The wine is kept for two years in barrels and then decisions are made about which type of Port it will become. All the wines will be tasted by an official panel before approval. All ruby Port spends less than 6 years in casks, and tawny Ports longer than that. Strict rules apply to the various types of Ports, the most recent date back to 2022.

The highest-ranked *ruby Port* is the *vintage*, which involves the best wines from two or three vineyards (quintas), spends two years in casks, is then bottled (unfiltered) and aged. Blends produce more complex, longer-aging, wines. A vintage is declared only when the conditions are good enough, which occasionally involves successive years, such as 2016–2017, or 1991–1992. Next are *single-quinta vintage*. As the name indicates, they are vintage Ports from a single vineyard, often bottled in years when a true vintage is not declared. *Crusted* Ports normally involve wines from three different vintage years (the year on the label refers to the bottling date). Then come the *late-bottled vintage* (LBV) Ports which spend 4 to 6 years in wood. The 'traditional' or 'unfiltered' ones keep on aging in the bottle. Finally, the common ruby Ports are labelled *ruby reserve*.

The highest-ranked *tawny Port* is from a single vintage year: the *Colheita*. It spends at least 7 years in wood, often much longer. Niepoort's Garrafeira is a special category. Then come blends which sometimes involve very ancient wines. The categories are *10, 20, 30, 40, 50 years old*, and *VVO* or *W* (over 80 years old) which is very, very old indeed. Taylor Fladgate produced a 'Kingsman edition' 90-year-old tawny. The number of years is not the exact average age of the blend but corresponds to wines with specific organoleptic characteristics and rarity. Finally, the common tawny Ports are labelled *tawny reserve*.

The *white Ports* start with the vintage *Colheita*, then Ports with indication of age: *10, 20, 30, 40 years old*, and finally *reserve white*, which are often dry. The sweetness is described as extra dry, dry, semi-sweet, sweet, very sweet, and Lágrima.

Since about 30 years, remarkable dry (red and white) table wines have been produced with the DOP 'Douro' appellation (Quinta da Pacheca, Ramos-Pinto, etc.). A well-known example is a collaboration of five estates, known as the 'Douro

Boys': Quinta do Vallado, Niepoort, Quinta do Crasto, Quinta Vale D. Maria, and Quinta do Vale Meão.

Távora-Varosa (1.2%, 0.1%. DOP: 'Távora-Varosa'; IGP : 'Terras de Cister', the land of the Cistercians) is so named because the first Cistercian monastery, São João de Tarouca, was built in the region in 1143. The DOP Távora-Varosa (named after two Douro tributaries) includes 'Méthode Champenoise' sparkling wines for which the region is famous (the Murganheira estate has memorable deep cellars carved into granite). Many small properties dot this mountainous plateau. The main cultivars are Pinot Noir, Aragonez, Tinta Barroca, Touriga Franca, Touriga Nacional in red, and Malvasia Fina, Chardonnay, Pinot Blanc, Cerceal, Gouveio, Bical, and Femão Pires in white.

Bairrada (5%, 3.3%. DOP: 'Bairrada'; IGP: 'Beira Atlântico') is best known for the productive Baga, a thick-skin, acidic, and tannic grape that produces some of the best red wines in Portugal. Quite a few single-variety (Baga) wines are bottled in the region. Many growers ferment with stems, adding even more tannins. These are wines for ageing. The name Bairrada refers to 'barros', the clay which dominates in the soil. The strong Atlantic influence means relatively high rainfall and moderate temperatures. In addition to Baga, there are other red cultivars such as the Alfrocheiro, Camarate, Touriga Nacional, or Jaen, which, individually or together, make up 85% of the *clássico* wines. The white grapes are primarily the Maria Gomes (or Fernão Pires), Arinto, Bical, and Cercial.

Dão (7%, 3.7%. DOPs: 'Lafões' and 'Dão'; IGP: 'Terras do Dão') is an ancient wine-producing region with rolling hills and granitic soil. It is located south-east of the Douro but has a more moderate climate. It is said that the famous (red) Touriga Nacional and (white) Encruzado originated from Dão. The Encruzado has an unusual and desirable property: it hardly oxidizes at all. The leading wine producer in the region is SOGRAPE, but there are numerous other winemakers, most of which work in a very traditional manner. The reds are made with the Touriga Nacional, Alfrocheiro, Tinta Roriz, and Jaen. They age beautifully. The whites come from the Encruzado, Bical, Cercial, Malvasia Fina, and Verdelho. It is common for these wines to be in thick Burgundy-style bottles.

Beira Interior (6%, 2.5%. DOP: 'Beira Interior'; IGP: 'Terras da Beira') is in mountainous eastern Portugal and enjoys a continental climate. It produces a wide range of wines from over 80 authorized cultivars. The dominant one in red are the Rufete, Marufo, Touriga Nacional, Alfrocheiro, Trincadeira, Touriga Franca, etc. and in white, the Síria, Arinto, Fonte Cal, Malvasia Fina, Arinto, etc. There are also rosé grapes such as the Gewurtztraminer or Malvasia fina roxa, etc. Some sparkling wines are produced.

Lisboa (10%, 20.4%. DOPs : 'Encostas d'Aire', 'Óbidos', 'Alenquer', 'Arruda, Torres Vedras', 'Lourinhã', 'Bucelas', 'Carcavelos', and 'Colares'; IGP: 'Lisboa') was formerly known as Estremadura. This region includes archaeological sites along the Tagus dating back to early Phoenician settlements. Lisbon was also from where wines were shipped to Rome and to their troops in northwestern Europe, and later to England. Three of the seven DOPs are very close to Lisbon: *Bucelas*, known for its

Arinto, Sercial, and Rabo de Ovelha white wines; *Colares* where the own-rooted Ramisco (in red) and Malvasia Branca (in white) vines flourish in sandy soil; *Carcavelos* – where Pombal had his estate – with the red Castelão, Preto Martinho, and white Galego Dourado, Ratinho, Arinto. Carcavelos is becoming a part of the greater Lisbon.

Tejo (7%, 10.1%. DOP: 'Do Tejo'; IGP: 'Tejo'), formerly known as Ribatejo, has abundant vineyards, cork-oak forests, olive trees, etc. It has six sub-regions (from north to south): Tomar, Santarém, Chamusca, Cartaxo, Almeirim, and Coruche. The climate is warm, there are many types of soil, and many cultivars are allowed: in red, Baga, Camarate, Trincadeira, Aragonez, Touriga Nacional, etc., and French grapes such as Merlot or Pinot Noir; in white, one finds the Arinto, Fernão Pires, Verdelho, Chardonnay, Alvarinho, etc.

Península de Setúbal (4%, 7.9%. DOPs: 'Setúbal' and 'Palmela'; IGP: 'Península de Setúbal') includes one of the most renowned sweet wines in the world: the fortified Moscatel de Setúbal, made from late-harvest Moscatel de Setúbal (Muscat Alexandria) and Moscatel Roxo grapes. The red wines from Palmela (Castelão and Trincadeira) are excellent as well. The landscape varies from flat and sandy to the hilly and picturesque such as the park of Arrábida.

Alentejo (15%, 16.4%, *além Tejo*: 'beyond the Tagus'. DOP: 'Alentejo'; IGP: 'Alentejano') stretches over about one-third of mainland Portugal but accounts for only 5% of its population. The region has many cork-oak forests. Numerous ruins of Roman villas are in this region, some of which have been excavated. It has eight subregions, with different soils and microclimates. There are numerous old-vine vineyards on the slopes of the Serra de São Mamede as well as large wine estates (such as the 1600-acres Esporão) in the plains. Alentejo is very hot in the summer. Many cultivars are authorized, for example Alfrocheiro, Aragonez, Castelão, Tinta Caiada, Trincadeira, Alicante Bouschet, and Moreto in red; Antão Vaz, Arinto, Fernão Pires, Rabo de Ovelha, and Roupeiro in white.

Algarve (0.8%, 0.1%, 'al Gharb', the West. DOPs: 'Lagos', 'Portimão', 'Lagoa', and 'Tavira'; IGP: Algarve) has vineyards along the south and west Atlantic coasts of Portugal. Algarve wines were exported to England as early as the thirteenth century (Simon 1906). The abundant white cultivars are the Arinto, Malvasia Fina, Manteúdo and Síria, and the dominant red ones are the Castelão and Negra Mole.

Madeira (0.4%, 0.1%. DOPs: 'Madeira' and 'Madeirense'; IGP: 'Terras Madeirenses') has recovered from the immense hardships of the mid-nineteenth to mid-twentieth century. It is an autonomous region of Portugal since 1976. Only six shippers are left, down from about 160 before oïdium. After Portugal joined the EEC, hybrids and American vines were banned and replaced by *V. Vinifera* cultivars. Tinta Negra is the dominant (red) grape. Four noble white grapes make up some 15% of the total planting. From sweetest to dryest (and from sea level to the higher altitudes), they are the Malvasia, Boal, Verdelho, and Sercial. There are several types of Malvasia: M. Cândida (only ~3 ha left), M. Branca, etc. The Boal or Bual is the rare Malvasia Fina. The Verdelho is the most abundant. The thin-skinned and late-ripening Sercial is rare but produces very delicate wines that need ageing. There is

very little left of the wonderful Terrantez, but more of it is being planted. The red Bastardo is still authorized but is (almost?) totally gone. The Madeira wines are fortified and undergo heat treatments: for common wines, several months in heated tanks around 45°C (*cuba de calor*), the intermediate quality in casks stored in steam-heated room (*armazém de calor*), while the best stay in barrels under the tropical sun (*canteiro*).

The top-quality Madeira wines is the *vintage* (single-harvest), which must spend at least 20 years in casks. The *colheita* is also a single-harvest wine but spends just over 5 years in casks. Then come blended wines (several vintage years) with average *15* ('extra reserve'), *10* ('special reserve'), or *5* ('reserve') years of age. They must contain at least 85% of the cultivar mentioned on the label, the rest is usually Tinta Negra. The *garrafeira* must be 100% of the cultivar specified on the label. The common *rainwater* is a pale, lighter style. Because of the length of time they spend in barrels, the Madeira wines are not just fortified, heat-treated, and aged, but also oxidized. This combination renders them very resilient, a characteristic that was especially precious in the early days of the wine trade.

Açores (1%, 0.1%. DOPs: 'Graciosa', 'Biscoitos' (on Terceira island), and 'Pico'; IGP: 'Açores') are modernizing and beautifully recovering from their near-total destruction in the middle of the nineteenth century, especially by oïdium. The Açores became an autonomous region in 1976, when most cultivars were still hybrids and direct producers. After Portugal joined the EEC, *V. Vinifera* cultivars were replanted, and the Verdelho, Arinto dos Açores, and Terrantez do Pico recovered. The local Arinto and Terrantez are specific to these islands, resulting from a cross between the Verdelho and some other *V. Vinifera*. Over 30 cultivars are authorized, but the Verdelho, Arinto, and Terrantez are the backbone of Açores wines. On Pico island, viticulture still uses the traditional currais (Figure 8). Old abandoned, vegetation-covered, vineyards are being cleared and replanted. We are still far from the area that was under vine in the mid 1850s. Wine is even produced on the island of Santa Maria, where the first Açores wine was made.

Historic Wines

The Association of Historic Wines of Portugal is a private organization established in 2008 to protect Portuguese wine culture and heritage. It proposed a class of historic wines, the *Vinhos Históricos de Portugal*. This is not an official classification (it is independent of the IVV), but recognizes unique wines and viticultural practices resulting from a combination of geographical origin, traditional grape varieties, use of ancestral viticultural and oenological practices (Loureiro 2009; Almeida Costa *et al*. 2021). Portuguese television has produced a series of documentaries on these historic wines.[t]

The Vinho Verde Enforcado is produced from *Enforcado*, *Arjões*, and *Ramadas* grapes growing in elevated trellises or on tall poplar trees, which often surround a piece of land in which food crops are grown. The grapes are harvested using tall ladders. The wild *v.v. sylvestris* vines are tree-climbing plants, and some of their

domesticated descendants are as well (Harutyunyan and Malfeito-Ferreira 2022). The Etruscans, and later the Romans, often grew their vines near a maple or willow tree for them to climb. This ancient viticultural technique is making a comeback in Italy: *vite maritata* ('married vine' – married to the tree) is now found again in several Italian regions. There are similarities with the *vinho verde enforcado*.

The *Palhete Medieval de Ourém* are tinted white wines made using medieval monastic practices. White grapes are fermented without skins and poured in barrels up to 80% capacity. The barrels are then topped off with juice and skins of long-macerated red wine ('tinta', Figure 4). The contact occurs through a hole in a clay vase filled with red wine and skins placed on top of the barrel.

Two historic (red, white, or light-coloured) wines are made in large (~1000 litre) clay jars, similar to the Roman dolia, in Alentejo. The inside of the jars is coated with a thin layer of hot pitch. These wines now have their own official regulations:

The *Vinho de Talha* (Figure 5) involves crushed grapes which are left to naturally ferment in the clay jars. Long wooden sticks are used to push the skins into the juice during the fermentation, after which the skins drop to the bottom. The vinho de Talha are often 'filtered' using simple woven baskets and the wines contain much of the lees. There are definite similarities with traditional Georgian wines fermented with skins, pips, and stems in buried *kvervi*.

The *Vinho Petroleiro*, Palhetes of Vila de Frades (Friar's village), also involve large clay jars. The wines differ from the vinho de Talha by the way they are tinted: vineyards have about 20% red and 80% white grapes which are harvested and crushed together resulting in a colour that resembles petrol, hence the name. This 'recipe' comes from old documents found at São Cucufate. Now in ruins, this monastery dedicated to Saint Cucufas was built on top of a large Roman villa.

The Vinho do Chão de Areia de Colares are ungrafted Ramisco (red) and Malvasia (white) grapes which grow in thick (several metres) sand near the Atlantic shore, and are protected from the wind by palisades. The vines grow as they please, and a single (long) cutting planted deep into the sand ends up producing a large bush where each branch crawls on the sand and over time, developing its own roots. The Colares wines have low-alcohol content but are fresh, crisp, and age beautifully.

The Vinho de Pico (Açores) are dry white wines produced from noble cultivars that grow in protected *currais* (Figure 8), mostly on Pico but also on Graciosa and Terceira islands. Historically, the most famous was the *passado*, obtained from Verdelho grown in a few special vineyards. This unfortified wine disappeared following the oidium crisis, but has now been revived as the 'Czar' wine by Fortunato Garcia. This wine ferments spontaneously up to 19% alcohol in two steps: the usual *Saccharomyces Cerevisiae* yeast ferments the wine up to about ~15% and the process stops for a few months. But then, a new fermentation starts (this does not happen every year). No one knows for sure which yeast is responsible for this, but *S. Bayanus* was suggested by Fábio Rocha. The *passado* has a total acidity between 6.7 and 7.2 g/litre, and residual sugar between 20 and 40 g/litre (in some years, more than 60). These wines have their own appellation.

It was nice to see that new generations of winemakers are taking over some of these old traditions. Ancient skills are easy to lose and, once lost, oh-so difficult to recover. These winemakers do not focus exclusively on historic wines, and also produce (amazing) modern-style wines.

Summary

Even though the wild (western) *V. V. Sylvestris* was abundant in the Iberian peninsula for thousands of years, there is no evidence of domestication, viticulture, or winemaking until the first Phoenicians colonies in the eighth century BCE. They established colonies near the mouth of various rivers, including the Tagus. The lack of evidence of a wild-to-domesticated *Vinifera* transition suggests that the Phoenicians brought cuttings of domesticated vines with them. At first, the wine production was modest, mostly for local consumption with limited trade.

Viticulture expanded after the Roman invasion of the Peninsula. Some of the wine produced along the Atlantic coast of Iberia made its way to Rome, some was shipped to Roman troops in northern Europe, but most of it was for the local market: the Roman legions consumed a lot of wine.

As Rome collapsed, 'barbarian' tribes (Suebi, Vandals, Alans) temporarily invaded the Peninsula, but then the Visigoths expelled them and established a kingdom. They enjoyed wine: viticulture continued, but the wine trade did not. After the Berbers and Arabs invaded in 711, parts of the Peninsula were under Islamic rule until the fifteenth century. Apart for the occasional fanatic rulers such as the Almoravids or Almohads, viticulture remained tolerated and wine produced, taxed, consumed, but not traded beyond the borders of the Peninsula.

The Reconquista progressed slowly. The kings of Asturias took advantage of Berber uprisings and internal disputes associated with the succession of an Emir or Caliph. The northern-western part of the Peninsula was re-conquered first, and this led to the emergence of Afonso, son of Henry of Burgundy, count of Portucale. At the time, this was just a thin slice of land between the Minho and the Douro rivers. Afonso fought his way south against the Arabs, successfully besieged Lisbon in 1147, and became King of Portugal. In order to maintain law and order in his newly-conquered territories, Afonso invited Cistercian monks and gave them land. They built monastic estates and organized wine production – leading to white wines 'tinted' to resemble to blood of Christ.

The wine trade with England began in the early days of Portugal. England imported considerable volumes of wine, mostly from France, some from Spain, and less from Portugal. But for Portugal, this was no doubt an important source of income. The English–Portuguese links were formalized in a series of treaties, starting with the 1386 political, military, and commercial Treaty of Windsor, which is still in effect today.

The age of maritime exploration arrived early in Portugal, at a time when Spain was busy with the Reconquista, England and France were at war, the Netherlands did not exist, and the Venetians and Genoese were busy in the Eastern

Mediterranean. Portugal explored the west coast of Africa, then rounded the cape to reach the far East, and sailed across the Atlantic to Brazil. It established colonies, discovered new riches and monopolized important trade routes – for a while. Portugal prevented viticulture in its colonies in order to provide a market for its own lesser-quality wines. The exceptions were Madeira and the Açores, which were parts of Portugal rather than colonies.

Long-distance shipping meant that wines spent weeks or months at sea, crossing the tropics and the equator, exposed to constant shaking and sometimes high temperatures. Most wines went bad. A major development was the fortification of wines. This allowed them to survive long journeys without spoiling. Distillation is a very ancient art, but the distillation of wine was first achieved in the late tenth or early eleventh century in Islamic Spain. The small amount of alcohol produced at the time was for pharmaceutical purposes. Large amounts of brandy suitable for human consumption and wine fortification became available in the early sixteenth century. The Flemish and Dutch merchants promoted it. They also encouraged better winemaking practices: strict hygiene, topping off barrels to compensate for evaporation, selection of higher-quality cultivars, and so on. Within a few decades, winemakers accepted the changes and produced not just fortified wines for shipping but also the first Madeiras, Sherries, Ports, etc. Some wines were intentionally aged. That had not happened since Roman times. Distillation and fortification changed the way people understood wine and consumed it.

Port wines became very popular in England, leading to a push for increased production. Producers started to cut corners and increased volumes by importing and mislabelling wines. The quality dropped, and so did the demand and prices. The crisis was resolved following the 1755 earthquake and the appointment of Pombal as a powerful prime minister. He quickly created a strong supervising administration for Ports. It imposed strict rules on the production and shipping, delimited the area allowed to produce Port wines, and limited the influence of English traders. Even though the powers of the *Companhia* were reduced after Pombal's internal exile, the model had been shown to work. Strict rules were reinstated in some form or another at later times.

Throughout the history of Portuguese wine, viticulture and innovations were often stimulated by traders, most of them English. They knew the market, purchased wines, and made a profit. But it is the people of Portugal who did the hard work in the vineyard and then produced the wine. This is still true today.

The French Revolution, followed by Napoleon's power grab, affected all of Europe. His invasion of Portugal degenerated into the terrible Peninsular War, during which the Portuguese economy all but collapsed. Napoleon's demise was followed by a European-wide recession. And then came a series of disasters, starting with oïdium (especially devastating in Madeira and Açores) and phylloxera. The latter forced growers to replant their vineyards using selected *V. Vinifera* cultivars grafted onto American rootstock. The First World War and the Great Depression complicated matters, as little or no funding was available for the enormous task

at hand. And then came the Second World War. After 1945, most of Europe started to rebuild. For viticulture, this involved planting single-cultivar vineyards with vines aligned in straight rows. Later, this allowed tractors to do much of the hard work. Technology quickly improved, changing the way grapes were pressed and macerated, wine was matured, then bottled and sealed with proper (Portuguese) corks.

Spain and Portugal fell behind because dictatorships prevented free enterprise, investment, and competition. This all changed after the 1974 Carnation Revolution and Portugal's admission to the EEC in 1986. The wineries quickly caught up and the results exceeded expectations. Today, Portugal produces an amazing array of wines from a surprisingly large number of native cultivars. There are hundreds of small producers, each of whom crafts unique wines that seem to be a perfect match for the local foods. Some winemakers still use medieval presses that improved on Roman ones, others use foot-treading in lagares – especially in the Douro region. Portugal is a must-visit country for wine lovers and wine-lovers to be.

Statistics published by the International Organization of Vine and Wine show that the world consumption of wine is dropping, a trend that started after the Second World War. Until the mid twentieth century, almost every European drank wine, especially with meals. But then soft drinks arrived, as did an ever-increasing variety of beers and other alcoholic beverages. Today, liquor stores and restaurants offer a vast array of options for drinking. Portugal still leads the world in per-capita consumption of wine, followed by Italy, France, Switzerland, and Austria. But it is fun to select the appropriate wine for every meal. After all, there are only a handful of carbonated beverages but thousands of different wines.

Climate change and global warming are growing threats to viticulture. One of Portugal's initiatives involves a non-profit organization (PORVID) which specializes in polyclonal vine selection. So far, over 30,000 clones of some 200 grapes have been preserved and are tested throughout the country. This preserves the genetic diversity and increases the resilience of Portuguese cultivars.

The World Health Organization is urging the Portuguese government to discourage alcohol consumption. But simply measuring the quantity of ethanol in a drink gives an incomplete picture. Wines, especially red wines, are macerated for up to several weeks. The process extracts a lot from the grape: tannins, antioxidants (e.g. resveratrol), and hundreds of compounds, including minerals that contain calcium, magnesium, phosphorus, fluoride, iron, and so on. Their interactions with the human body are complex and poorly understood, but they affect digestion, blood circulation, and numerous other functions. Quality wine is much more than just alcohol and water. While all ethanol molecules are the same, not all alcoholic beverages are the same. Discourage your friends from taking shots of cheap tequila or vodka, but encourage them to sip a Terrantez do Pico with grilled shellfish, taste a Medieval de Ourém with a properly-sliced leg of Pata Negra, or savour an old Baga with dinner. After the First World War, many countries enforced some form of alcohol prohibition. France did not, but encouraged her citizens to look for quality:

'drink well, drink a little, in order to drink for a long time'. Paraphrasing Sir Clement Raphael Freud:

If you stop drinking good wine, you don't actually live longer: it just seems longer.

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Notes

a. Today's historic *Vinho Verde Enforcado* may well be direct descendants of such vineyards.

b. The Vandals were obliterated in North Africa by Justinian's general Belisarius in 535.

c. 'Santiago' is old Galician for the Latin *Sanctus Iacobus*, Saint James, and 'Compostella' comes from the Latin *Campus Stellae*, the field of stars.

d. León and Castile were permanently united under Ferdinand III in 1230.

e. In the sixth century, a monastery consisted of a collection of hermits, not a regulated community.

f. The French had made the same mistake at the battles of Crécy (1346) and Poitiers (1356), but failed to learn from these defeats: they used the same tactic at Aljubarrota, and then again at Agincourt (1415). If at first you don't succeed... At the end of the Hundred Year's War, the French finally won against the English longbow with canons, a novelty in Europe at the time.

g. The *pipe* is an elongated barrel bulging in the centre and tapered at the ends: a truncated rugby ball. Its capacity changed over time and depended on the region, possibly because coopers used different types of wood. The pipe contained a fixed number of *almudes*, a container of about 20 litres (16.8 in Lisbon and 25.4 in Porto). The export pipe to England had 420 litres, the Madeira pipe varied from 415 to 600 litres. The Lisbon pipe had 420 litres in the fourteenth and fifteenth centuries, and 530 in the eighteenth and nineteenth centuries. The Port pipe had 525 litres. In 1750, the US state of Virginia legislated the pipe at 120 gals (about 455 litres). Since taxes were paid per pipe, larger pipes reduced the tax per litre. The *hogshead* was one-quarter pipe, the *tun* two pipes, and the *butt* was between a pipe and a tun. Loureiro pointed out that the Portuguese *pipa* is sometimes mistranslated as 'kite' instead of 'pipe' (https://context.reverso.net/translation/portuguese-english/pipa).

h. Her extravagant dowry included Bombay in India and Tangiers in Morocco (Hatton 2020).

i. Following the 1789 Revolution, France confiscated and auctioned off all religious properties. Priests became employees of the state. Napoleon acted against the power of the Inquisition. In Portugal, the Church was powerful, but the Cistercian monastery of Alcobaça had supported Miguel and the absolute power of the monarchy during the War of the Two Brothers. Miguel lost. Following the abolition of religious orders, all the monks had to leave, but nuns were allowed to stay in their nunnery until the last one died. That was Madre Carolina Augusta de Castro e Silva, who died in 1909.

j. André Jullien passed away in 1832. The fourth edition of his book (1866) contains edits and additions by C.E. Jullien, assumed to be his son. The status of viticulture described in the 1866 edition is clearly

pre-oïdium, but the text does mention a Royal Decree dated 1852. It is therefore likely that it was written in the very early days of the oïdium infestation.

k. That wine was distilled and barrel-aged. In 1986, it was bottled by the Instituto da Vinha e do Vinho as *Aguardente Vinica Reserva*; 8007 *garrafas* were produced (mine has number 5673).

l. The melting point of tungsten is above 3400ºC: it was needed for the nozzles of German rockets.

m. Heat treatments of (partially oxidized) wines were done in Roman times. In order to mimic the flavours of an aged wine, the Romans would sometimes 'smoke' the wines by storing filled amphorae in an attic exposed to smoke from a (chimney) fire in the room below it. Even though the Romans attributed the improvement to the smoke itself, there is no doubt that the wines were also exposed to heat.

n. I have never tasted a wine thus matured (or is it 'manured'?). I suspect that it is an acquired taste.

o. *There was an old man in Madeira/Whose stories got queera and queera/The guests gathered round/Said his vinum was sound/But his veritas rather too vera.*

p. *Lagares* or similar foot-treading areas are very ancient. The oldest ones were found in the Areni-1 Neolithic site in southern Armenia, dated c. 4100 BCE. The oldest one in the Iberian Peninsula is Phoenician, at Castillo de Dona Bianca between Jerez and Cadiz (Figure 1).

q. The pre-phylloxera vines in the Romanée-Conti vineyard in Burgundy were torn up in 1945, grafted vines were replanted in 1947, and the first harvest of the grafted Pinot Noir took place in 1952.

r. AOC is now AOP ('protected' replaced 'controlled') and the label is applied to products far beyond wines.

s. The word 'garrafeira' associated with table wines indicates a superior quality, akin to the commonly used 'reserva' in Spain or Italy, for example. In Madeira, it indicates that a wine is made with 100% of the cultivar indicated on the label (normally, up to 15% of the wine can be – and almost always is – Tinta Negra). As for Ports, 'garrafeira' now refers to the unique aging process used by Niepoort. Some ancient Port bottles are marked 'garrafeira' to indicate superior quality. This is unrelated.

t. Documentaries on these wines are at https://www.rtp.pt/programa/episodios/tv/p45474

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