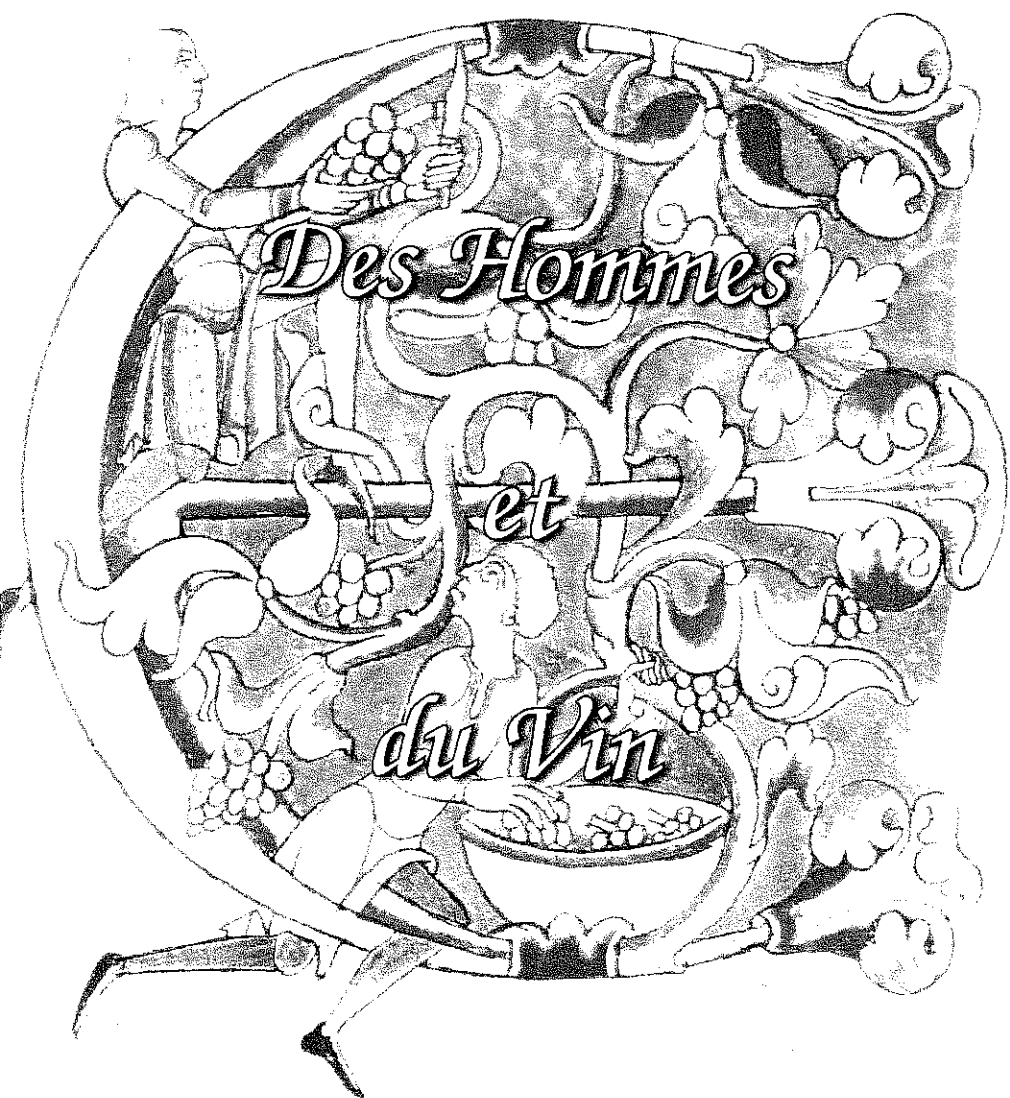


Rencontres du Clos-Vougeot 2010



Sous la direction de Jocelyne PERARD et Maryvonne PERROT

Des hommes et du vin :

Le vin, patrimoine et marqueur d'identité culturelle

**Sous la direction de Jocelyne PERARD
et Maryvonne PERROT**

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The archaeological and chemical hunt for the origins of viniculture

Le vin à l'origine des civilisations

Patrick E. McGovern

Clos de Vougeot is the ideal venue for a talk on ancient wine, since this is where it all began in one sense. We just have to step outside the doors of this former Cistercian abbey, and we can gaze on the *terroir* where the monks determined by trial-and-error over 8 centuries that Chardonnay and Pinot Noir were the best cultivars to grow in this particular place, as epitomized here by the Domaine de la Romanée Conti in Burgundy. Going back to the 12th century, the Cistercian monks are said to have literally “tasted the soils” of the Côte d’Or, and although seemingly just another field along the middle slopes of the hills, this and other outstanding vineyards nearby represent what *terroir* is all about and became a model for the rest of the world.

If we now jump back not just 100’s of years but 1000’s to some of the first experimentation by our ancestors, we principally find ourselves in the Middle East, home to the Eurasian grapevine, but no doubt in other temperate climates, like China, where other grape species are found. We need to transport ourselves back to when humans lived in a much more mysterious world and when empirical observations weren’t just important in making good wine but any wine at all, and staying alive. Lacking a time machine, we have to do this by drawing upon the bits and pieces of evidence we have from the past and present and try to imagine what might have happened.

My most recent book is *Uncorking the Past*¹. Its cover image shows an Egyptian funerary stela, dated about 1350 BC² – perhaps from the capital of Amarna – which shows an Asiatic drinking barley beer in standard Near Eastern fashion through a straw or drinking tube. If you were drinking grape wine, a refined goblet

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1. Patrick E. McGovern, *Uncorking the Past ; The Quest for Wine, Beer, and Other Alcoholic Beverages*, Berkeley: University of California Press
 2. Before Christ

or a gargantuan drinking horn might be used. Together with *Ancient wine*³ one of my former books, which received the Grand-prix in history, literature and the fine arts [Histoire, Littérature et Beaux-arts] from the Organisation Internationale de la Vigne et du Vin (OIV), *Uncorking the Past* present the latest evidence that we can draw upon to reconstruct really ancient viniculture. There are indeed archaeological evidences – the pottery sherds, grape seeds, and other remains – that survived the millennia and which can be analyzed scientifically. There are the Greek and Roman agricultural writers, such as Pliny the Elder and Columella, nearly half of whose works are taken up with wine and the vine, showing just how important this subject was. Their descriptions cannot be accepted at face value, since sometimes they are just repeating what an earlier writer said or are swayed by an outdated world-view or magic. Ancient art also has much to tell us about viniculture, but again it can just be stereotyped images. More recent ethnographic examples of traditional winemaking also need to be examined. Finally, assuming one develops a scenario of how an ancient wine was being made, it can be tested by “experimental archaeology” – that is, one can try to make an ancient beverage the same way today, to see whether it is even possible and find out what it tastes like. The Mas des Tourelles winery, along the southern Rhone River at Beaucaire, illustrates what can be achieved by “experimental archaeology”. Here, the well-known archaeologist of Roman viniculture, André Tchernia and his colleagues erected a replica of an ancient Roman winepress and proceeded to make a sherry-like wine, called Turriculæ, following the ancient Roman writer Columella. Lilac and fenugreek were added to the wine, and it was aged in subterranean jars. Wine-drinkers and connoisseurs can readily appreciate this melding of old and new evidence. This point was driven home to me in 2004 when I traveled to northern Portugal and the remote Douro River region where port wine is made, and such a traditional scene can with no doubt be seen near here. There I actually got into the treading vat and used my feet to trod out the latest vintage, which promises to be one of the best of the new century. The human foot is ideally configured to extract the juice and not break the seeds and introduce their tannic bitterness, which instead float to the surface.

This is the way I like to think of my own research. Archaeological Chemistry or Biomolecular Archaeology combines discoveries from the past and present. A revolution in scientific techniques over the past 40 years has made it to possible to re-examine and, in many cases, re-write the history of wine. We are just at the beginning of this process, which promises many more discoveries and perhaps even a few new taste sensations. My research into ancient wine really got going when I organized a conference on “The Origins and Ancient History of Wine” at the Robert Mondavi winery in the Spring of 1991. I was brought in touch with wine scholars from around the world and this set my research agenda for the next decade, as I went in search of ever more ancient wine. The star of the show at our 1991 Mondavi conference was this rather nondescript pottery jar from Godin

3. Patrick E. McGovern, *Ancient wine: the search for the origins of viniculture*, Princeton University Press

Tepe, Iran, dated to about 3500 B.C., which at the time was the oldest chemically confirmed wine jar in the world. Virginia (or Ginny) Badler was the first to note a reddish residue on the inside of the jar. Our chemical analyses, which I will describe shortly, showed that the jar had originally contained a resinated wine. If you have tried Greek *retsina*, you have some idea of what a resinated wine tastes like – definitely an acquired taste, but one easily come by while traveling in Greece.

The Godin Tepe jar inspired me to look for even earlier evidence of wine and made me wonder : just how early were humans making and drinking fermented beverages and why have humans had a seemingly millennia-long love affair with alcoholic beverages around the world ? If you think about it and even if you don't have any firm chemical evidence, you might surmise that members of our species, even 100,000 years ago, were probably already making beers, wines and extreme beverages from wild fruits, honey, chewed grains and roots, and all manner of herbs and spices culled from their environments. After all, our ancestors had much the same sensory organs as we do, and they would have known what they liked, just like the Cistercian monks. It is not difficult to imagine a group of our ancestors foraging in a river valley, near their cave. They would have been very observant in a world that they did not fully understand and in which they would have been on the lookout for any plants or other substances that might extend life beyond the usual 30 years or less, or help cure disease. We can imagine early humans being captivated by a brightly colored wild fruit like a deep red grape, since we are very visually oriented. They would gather up as many wild berries as possible in season, perhaps into an animal hide or wooden container which has been crudely hollowed out. Depending on their ripeness, the skins of some grapes rupture at the bottom of the container and exude their juice, under the accumulated weight of the grape mass above. If the grapes are then left in their container, gradually being eaten over the next day or two, this juice will ferment, owing to the natural yeast “bloom” on the skins, and become a low-alcoholic wine—a Stone-Age Beaujolais Nouveau or a kind of French farmhouse ale. Reaching the bottom of their primitive “barrel,” our imagined caveman or woman will dabble a finger in the concoction, lick it, and be pleasantly surprised by the aromatic and mildly intoxicating beverage that has been produced accidentally. More intentional squeezings and tastings might well ensue.

In fact, all animals – from the lowly fruit fly to the elephant – are enticed by sugar and alcohol. Fermentation probably represents the earliest energy source on earth. Recently, Malaysian tree shrews, which are classified as among the earliest primates on the planet going back 55 million years, have been documented binging all night long on fermented palm nectar—drinking the equivalent of 9 glasses of wine for the average human. No wonder, this little guy has conked out; elephants are not nearly so subdued – too much alcohol, and they can go on a rampage. According to what has been dubbed the “Palaeolithic Hypothesis” or the “Drunken Monkey Hypothesis,” our ancestors might well have had the same attraction to fermented products. Modern primates generally have diets comprised of 75%

fruit, and they are known to eat as much fermented fruit or drink as possible when given the chance. Chimpanzees, especially males, have been shown to down 3-4 bottles of wine if given the opportunity at a kind of "open bar." Early hominids (Proconsul), going back 24 millions of years ago (also Lucy from ca. 3.2 millions of years ago) have small teeth adapted to eating soft foods, like fruit. Since food resources are often in short supply, the animals predictably gorge themselves on the sweet, fermented fruit. Intriguingly, figs (some 500 species around the world) are among the earliest domesticated fruit known archaeologically—first attested around 10,000 years ago in the Jordan Valley.

In short, our human ancestors very likely coopted the natural process of fermentation to make alcoholic beverages. Alcohol was the universal drug, and its health benefits were obvious – alcohol relieved pain, stopped infection, and seemingly cured disease. Those who drank fermented beverages rather than water, which could be tainted with harmful microorganisms and other parasites, lived longer and consequently reproduced more. At an even more basic level, we can metabolize alcohol into energy, since about 10% of the enzymes in our livers, including alcohol dehydrogenase, carry out this function. Fermented beverages also eased the difficulties of everyday life; it lubricated the social fabric [esprit de corps] and contributed to a joyful exhilaration in being alive.

The real trump card of an alcoholic beverage is its mind-altering effects. It tapped into mystical, "unseen" realms and unleashed a "pleasure cascade" in the human brain. When we take a drink, all the major neurotransmitters – dopamine, serotonin, and opioid compounds, like the β -endorphins and enkephalins – course through our brains and stimulate us initially; then, as we imbibe more and more, the depressant effects take over – the trick is to know when to stop. Both the mind-altering effects of a fermented beverage, as well as the mysterious process of fermentation, probably account for why fermented beverages came to dominate entire economies, religions, and societies over time. The yeast cell, budding at the right, was microscopic and too small for ancient humans to see, but it is responsible for converting the sugar in a fruit, grain, honey, or root into alcohol in a seemingly miraculous process. The carbon dioxide, evolved during fermentation and roiling the surface of the fermenting wort or fruit juice, must have amazed the earliest beverage makers. If fermentation was carried out in a pottery jar, we can imagine it rocking back and forth. It was like an invisible force was at work. When they drank the beverage, they were even more amazed, as if the same supernatural power had consumed them.

Wherever we look in the ancient or modern world, humans have shown remarkable ingenuity in discovering how to make fermented beverages and incorporating them into their cultures. For example, African cultures where our species began are awash in sorghum and millet beers, honey mead, and banana and palm wines. In these fermented-beverage cultures, everyday meals, social events and special celebrations, including rites of passage and major festivals, all revolved around an alcoholic beverage from birth to death. To explain this universality of fermented-beverage cultures, I believe the "Palaeolithic or Drunken Monkey

Hypothesis" will eventually be shown to be a prime force in making us what we are today, physically and culturally, and fundamental to the human condition. Unfortunately, obtaining convincing evidence for this very early period has so far eluded our chemical techniques.

Since finding and analyzing a Palaeolithic wine vessel was a long-shot, after the Mondavi conference I thought that my best bet was to look at a later period: the Neolithic period from about 8500 B.C. down to 4000 B.C. when it seemed likely that wine could have been produced on a large scale, especially if the Eurasian grapevine had already been taken into domestication – a momentous innovation indeed requiring a lot of other pieces to fall into place. Neolithic villages, like the one at Hajji Firuz Tepe, also in Iran but farther north of Godin Tepe in the Zagros Mountains, were among the first, permanent, year-round settlements. These villages were a direct result of humans taking control of their food resources by domesticating a variety of plants and animals. The invention of pottery around 6000 B.C. gave more impetus to the process, since special vessels for preparing and storing wine and other foods and beverages in stoppered jars could now be easily made. What can be termed a Neolithic cuisine emerged. A variety of food processing techniques – fermentation, soaking, heating, spicing – were developed, and Neolithic peoples are credited with first producing bread, beer, and undoubtedly an array of meat and cereal entrées that we continue to enjoy today.

What better place to look for evidence of wine dating to the Neolithic period than my home-base at the University of Pennsylvania Museum, which has one of the best collections of well-documented excavated artifacts in the world. After the conference, I simply asked a Neolithic archaeologist – Mary Voigt – if she had ever noted intriguing residues on any of the Neolithic pottery she had excavated. In 1968 she had directed the expedition to Hajji Firuz. Yes, she told me, she did remember some yellowish residues on the bottom of a narrow-mouthed jar. This jar and 5 others were set into the clay floor and lined up along the wall of the kitchen, with an oven and other cooking vessels. Each had a capacity of about 9-liters or 2½ gallons when full. At the time, Mary had thought the residue might be from milk, yogurt or some other dairy product. A chemical analysis at the time, however, had come up negative; the techniques simply weren't sensitive enough. The sherds then sat in the Near Eastern storage room in the museum's basement for twenty-five years. Once we dug the sherds out of storage, we went to work using more modern methods to solve the archaeological puzzle of what the jars originally contained. Using infrared analysis, liquid and gas chromatograph and mass spectrometry – all tools readily available to an aspiring biomolecular archaeologist today – we examined the yellowish deposit on the Hajji Firuz sherd. One organic compound, in particular, is characteristic of wine, occurring in large amounts only in grapes: tartaric acid. I won't tax the chemically challenged in the audience except to point out that this acid and its more insoluble potassium and calcium salts readily precipitate out from solution and make up much of the lees that one sees in an unfiltered wine. Since tartaric acid is found in large amounts only in grapes in the Middle East, its dominant presence in the Hajji Firuz sherd

and residue pointed to a grape product, most likely wine since once the grapes have been expressed as a liquid (obvious from the narrow mouth on the vessel and the accumulation of residue on the bottom of the jar), it will quickly ferment to wine in the warm climate of the Middle East. Of course, if oxygen remains available, fermentation can continue and eventually the acetic acid bacteria will convert all the wine to vinegar – this is called “wine disease” that any competent winemaker, even one living in the Neolithic period, wants to avoid. Although cork was not yet available, raw clay stoppers function the same way, absorbing liquid and expanding to seal off the mouth of the jar. Such stoppers were found in the vicinity of the wine jars at Hajji Firuz. After the clay cork was popped, I could try to sniff out the oldest vintage in the world – a tried and true method of biomolecular archaeology! Although we had previously analyzed a sherd with a yellowish deposit, the inside of this jar had a reddish residue – no doubt, it was the red to go with the white, although we are yet to prove this chemically.

Another chemical constituent of the Hajji Firuz residue, which prevents the dreaded wine disease, made it virtually certain that the jar originally contained wine. We identified terebinth tree resin, derived from the sap of a tree that grows throughout the Middle East and produces large amounts of resin in fall when the grapes are maturing. Pliny the Elder, the famous 1st c. A.D. Roman encyclopedist, devoted a good part of book 14 of his *Natural History* to the problem of preventing wine turning to vinegar. Tree resins – pine, cedar, frankincense, myrrh, and very often, terebinth which was known as the “queen of resins” – were added to Roman wines for just this purpose. He even went so far as to say that “There is no department of man’s life on which more labor is spent.” Evidently, this method of preserving wine went back a lot earlier than Pliny, and our chemical analyses over the past ten years have shown that resinated wine, which was also one of the most widespread human medicines in antiquity, was the overwhelming favorite for thousands of years. Strangely, it is only produced in Greece today as *retsina*. The most famous and expensive tree resin additive to Roman wine was myrrh, which came from the Arabian peninsula and the Horn of Africa. This resin even has an analgesic effect, so that if the desired goal of preventing the wine from becoming vinegar failed, at least one’s senses were numbed.

With evidence like this from Hajji Firuz, it was starting to look likely that the winemaking industry took off in the Neolithic Period, and if this were true, then it was likely that the Eurasian grapevine (*Vitis vinifera sylvestris*) was taken into domestication then, like so many other plants and animals at this time. 6 jars in the Hajji Firuz kitchen, if they all contained wine – some 55 liters [15 gallons] – are the “smoking gun”. The house that hosted that kitchen was an ordinary residence, and if the amount of wine there is multiplied many times over by houses throughout the settlement, then we’re talking about a lot of wine, much more than could be produced by gathering wild grapes. Of course, some of the wine might have turned to vinegar, but how much vinegar is needed to marinate your meats or dress your salads?

What makes the domesticated vine so desirable is that it’s hermaphroditic – that is, the male (stamens) and female (pistil) parts are located on the same plant – so it produces much more fruit on a predictable basis. This self-fertilizing plant could then be selected for larger, juicier and tastier fruit and fewer seeds, and cloned by transplanting branches, buds, or rootings. This assumes further that humans had discovered how to propagate the vine horticulturally, since its seeds are genetically too variable. But how early was the vine domesticated and did it happen in only one place, perhaps at Hajji Firuz or somewhere else in the upland region of the Near East where the wild grape thrives? DNA studies of ancient and modern grape are now in progress, and we may have the answer about the earliest domestication soon – but there is still a great deal of controversy about this.

The debate all boils down to whether the Eurasian grapevine was domesticated in only one place at one time and then transplanted from place to place, or whether it was domesticated in many different places and times, including Europe. The Noah Hypothesis is an apt phrase to describe a one-time origin of viniculture in one place, because the biblical patriarch’s first goal, after his ark came to rest on Mount Ararat, was to plant a vineyard and then make wine (Genesis 8.4 and 9.20). Like the Eve Hypothesis, which claims to trace all of humanity to an original human “mother” in East Africa [whether 2 million or 200,000 years ago] on the basis of mitochondrial DNA lineage trees, a similar investigation of the Eurasian grape would seek the ultimate progenitor of modern domesticated grape varieties.

We don’t know whether the Hajji Firuz wine was made from the domesticated or the wild Eurasian grape. The site does lie within the modern distributional zones of the wild grapevine, so the grapevine could already have been domesticated here. Other sites, generally dated between about 6000 and 3000 B.C. have yielded ancient grape remains or wine jars as attested by chemical analyses. The wild vine in fact extends farther west all the way to Spain and is also found in oases in central Asia.

To test the Noah Hypothesis, we’re focusing on two other areas farther north, where the wild grapevine thrives – the Caucasus Mountains, sometimes argued to be the so-called “world center” of the Eurasian grape where its greatest genetic diversity is found. The Taurus Mountains of eastern Turkey are also a real possibility – this is where some of the so-called founder plants for the Neolithic period were first domesticated, including einkorn wheat, chickpea and bitter vetch. Perhaps, this was where the grapevine was first domesticated. This upland region of the Caucasus, Taurus, and Zagros Mountains are all possibilities for the earliest domestication and the beginning of winemaking. What especially makes me think that the origins of viniculture may be found here is that there is a great deal of archaeological and historical evidence for what can be called a “wine culture” gradually radiating out in time and space, from small beginnings in the northern mountains of the Near East in the Neolithic, to become a dominant economic and social force throughout the region and later across Europe in the millennia to follow. One might say that we’re looking for the vinicultural Garden

of Eden. There's a lot of territory to cover in these mountains, and we've only been sampling archaeological materials and grapevine for about 10 years. What is becoming increasingly clear, as we pursue these combined archaeological and chemical investigations, is that the world's first "wine cultures" emerged in this upland area by at least 7000 B.C.

Most of us know what a "wine culture" is. In short, it is a culture in which everyday meals, social events and special celebrations from birth to death, including rites of passage and major festivals, are marked by the drinking or offering wine. With time, viniculture comes to dominate the economy, religion, and society as a whole. Even today, meals are presided over by a toastmaster, who offers up numerous toasts throughout the meal to the motherland, family, and life itself – impossible to imagine apart from wine. Large underground jars, one is seen in the foreground of the painting and a large ancient complex is being excavated on the left, are used to ferment the wine on their lees. No large subterranean jars have been found in Neolithic villages as yet.

Although Neolithic Georgia is an excellent candidate for where winemaking emerged in the Near East, the impetus for a "wine culture" could have come from elsewhere in the highlands. Although we have yet to investigate the Zagros, in 2004 we explored the remote area of the Taurus Mountains in eastern Turkey. The region that I'm talking about is at the headwaters of the Tigris and Euphrates Rivers, not far from Mt. Ararat. This was likely a "hotbed" of experimentation in the Neolithic period. DNA evidence supports the domestication of one of the Neolithic "founder plants" – einkorn wheat – here, and chickpea and bitter vetch are also traced to this region, so why not the grapevine? However, no large subterranean jars – used to ferment the wine on their lees – have been found in Neolithic villages as yet.

Most important for the issue of early viniculture, many stone goblets and bowls have been recovered from Nevalı Çori and other early Neolithic villages [Körtik, Hallan Çemi, Çayönü, Göbekli Tepe] in the region. The stone used to make these bowls is chlorite, a clay mineral with highly adsorbent properties. We are now in the progress of analyzing the copious amounts of ancient organics retained in pores of this mineral. These bowls could well be important as the earliest evidence for wine having been prepared, drunk, and offered to the gods. Such vessels led on to the earliest pottery, beginning around 6000 B.C., which included larger jars and sieves, ideal for processing and storing wine. With my colleague from the university of Ankara, our search for wild vines in this region was an adventure. Our efforts were rewarded. For example, in one place a hermaphroditic plant was positioned between a wild male and female vine, exactly the situation that an early viticulturalist would need to have observed and selected for. In 2006, we published a DNA paper, in collaboration with José Vouillamoz from University of Neuchâtel and viticulturalists at the University of Ankara, in *Plant*

*Genetic Resources: Characterization and Utilization*⁴ about the modern cultivars of the region. It shows a close relationship between some Georgian and European varieties, especially Pinot, suggesting that the ultimate origin of this great grape of Burgundy is to be sought in the Near East. A follow-up article is now being prepared comparing these results with those of wild grape in eastern Anatolia – this will address the question of the earliest domestication of the Eurasian grape.

We are currently developing techniques to extract ancient DNA and compare modern wild and domesticated microsatellite sequences, including nuclear and chloroplast DNA. It may be possible to isolate a hermaphroditic gene or make inferences from other parts of the genome related to the domesticated vine, with desirable winemaking traits, that will resolve whether or not a single domestication initially occurred in the uplands of the Middle East and spread from there to other parts of the ancient world. As I've said, I think that the single domestication theory, the Noah Hypothesis, will eventually win out. There is a great deal of historical and archaeological evidence for a "wine culture" spreading out from the northern mountainous regions of the Near East to points south, east, and west. It had reached the Jordan Valley around 4000 B.C., and spread to the southern Zagros Mountains by the end of that millennium.

The wine culture also spilled over into Egypt. Like the southern Levant, the wild grape never grew in Egypt. Yet, a thriving royal winemaking industry had been established *de novo* in the Nile Delta by at least Dynasty 1, ca. 3000 B.C., probably under the tutelage of Canaanite winemakers from Lebanon and the southern Levant.

Numerous tomb reliefs and frescoes illustrate the vinicultural process – from picking the grapes overhead from well-trained pergolas, to stomping them out in small presses, to transferring the red-colored must to amphoras for fermentation, and stoppering the jars for storage. What appears to be happening in the earliest stages of Egyptian history is that the pharaohs first began to import wine as a costly, prestige item. Today, we might try to impress our neighbors with a Romanée Conti or Pétrus. In ancient Egypt, it wasn't just conspicuous consumption – what the pharaoh drank eventually was incorporated into religious ritual and social custom. The next logical step was to transplant the grapevine itself, and begin producing wine locally to assure a more steady supply, at a lower cost and tailored to local tastes. In Egypt, imported wine from the Jordan Valley and its environs appears to have provided the impetus for establishing a royal winemaking industry in the Delta. Around 3150 B.C., before the Delta industry began, one of the first pharaohs of Egypt, Scorpion I of Dynasty 0, had 700 jars containing some 4500 liters (almost a 1000 gallons) imported from there and piled high in his tomb at Abydos, to ease his way into the afterlife.

Besides showing that this wine was laced with a tree resin, our chemical analyses have revealed that many different herbs – probably including savory,

4. Patrick E. McGovern, J. F. Vouillamoz, A. Ergul, G. Söylemezoglu, G. Tevzadze, and M. S. Grando. *Plant Genetic Resources: Characterization & Utilization*, 2006, 4.2: 144-58

wormwood, coriander, mint, sage and thyme among others – were added to wine. Our published articles in the Proceedings of the National Academy of Sciences⁵ and the International Journal of Oncology⁶ make the case that this wine was not just for the pharaoh's enjoyment, but might well have had medicinal, even anti-cancer properties. The alcohol in wine, it turns out, is a perfect medium for dissolving and dispensing drugs. These herbs were identified by bioinformatics searches as savory (*Satureja*), wormwood/mugwort (*Artemisia*), tansy (*Tanacetum*), balm (*Melissa*), senna (*Cassia*), coriander (*Coriandrum*), germander (*Teucrium*), mint (*Mentha*), sage (*Salvia*), and thyme (*Thymus/Thymbra*), which had either been used individually or in combination.

To conclude, I'll briefly describe our most recent project: tracking the Near Eastern wine culture from east to west across the Mediterranean to southern France and ultimately Burgundy. What I propose is that the Canaanites and Phoenicians, with their renowned sailing vessels called "Byblos ships," were instrumental in establishing new wine industries and spreading the wine culture, along with Royal Purple dyeing, the alphabet and much more, one step at a time spread across the Mediterranean. The recent discovery of two Phoenician ships off of Ashkelon in Israel, loaded with thousands of wine amphoras being transported to Egypt or Crete from a Lebanese port, is just the tip of the archaeological iceberg. More explorations using remotely operated vehicles will likely discover much more evidence of the Canaanite and Phoenician role. Note that the earliest Greek and Etruscan inscriptions, based on the Phoenician alphabet, are wine inscriptions. We have evidence that the wine culture probably first reached Greece by at least 2200 B.C., so the Canaanites might have been plying these waters with their loads of wine long before the Phoenicians. We identified the earliest *retsina* at the site of Myrtos-Phournou Koryphe on the southern coast of Crete, and maritime contacts with Canaan could well have played a major role in introducing wine to the central Mediterranean. The Greek traders likely entered the picture later than the Levantine traders. Greece was still dominated by a mixed beverage, a kind of "Greek grog," made from Pramnian wine, honey and barley, topped with cheese—the so-called *kykeon* of the Homeric epics. It was served up in large cauldrons and drunk from cups, like marvelous Nestor cup at the right, found at Mycenae and described in the Iliad. When the Greeks adopted the alphabet from the Phoenicians, the wine culture probably went with it.

Eventually, the Etruscans entered the picture and became a major conduit of the wine culture to southern France. Their amphora is modeled after the Phoenician amphora, and where a similarity of form exists, one can make a good case that it is due to direct contact with the Phoenicians and was used for the same contents, namely grape wine. In my opinion, the Etruscans thus took up the banner

of the "wine culture" mainly from the Phoenicians, and to a lesser extent from the Greeks, who were more wedded to a mixed beverage, and eventually embarked upon the mass production of wine and its shipment by boat, especially to southern France by 600 B.C. The ultimate answer to the relative involvement of Phoenicians, Etruscans, and Greeks in transferring the wine culture to France partly lies at the bottom of the Mediterranean where so many shipwrecks full of wine-related pottery have been discovered and excavated. It should also be noted that a profusion of Iron Age shipwrecks have now been located and excavated along the Italian and French coasts. They were so loaded up with wine-related vessels that, in a very real sense, one could say that the transfer of first Phoenician and Greek culture and then Etruscan culture in the Western Mediterranean was mediated by the wine culture itself. On land, archaeological excavations can also contribute a great deal to solving the puzzle. We have begun a new project with Michel Py and colleagues of the CNRS, analyzing what are believed to be some of the earliest wine amphoras from sites in southern France. The heavily Etruscan-influenced site of Lattes, near Montpellier, is a major focus, but we are also looking at more Phoenician-influenced sites to the west, such as Pech Maho. Results are still preliminary, but very promising. Just like in Greece and on Crete, Etruscan and Celtic grogs might well have preceded the introduction of grape wine.

The history of civilization is, in many ways, the history of wine. The domesticated grapevine and winemaking was carried by the Etruscans, and later the Romans, to southern France. Relatively recently, viniculture has spread to the New World. Almost every New World wine, with their infinite varietal range of tastes and bouquets, ultimately derives from the Eurasian species of the mountainous Near East transplanted or crossed again and again. Each culture (whether French, Canaanite, Phoenician, Egyptian, or Californian) has its own story to tell about its relationship with wine and the vine. Together, they form a truly remarkable history of a truly remarkable plant and its product intertwining itself with human culture throughout the world. As the archaeological and chemical study of wine—both ancient and modern—continues, it may someday be possible to harness the full genetic and social potential of *Vitis vinifera vinifera* for our sensory and intellectual enjoyment. In the meantime I am reminded of Marcel Proust in his *A la recherche du temps perdu*, where wine and food, such as his madeleine cakes dipped in linden tea, has the ability to evoke memory. In like fashion, the dynamic history of this single grape species, with its inexhaustible range of tastes and bouquets, is recapitulated every time we raise a glass of wine to our lips.

Patrick E. McGovern
University of Pennsylvania Museum

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