

## On the Subject of Oak



By George Parkinson

Oak as a medium for fermenting, aging, and storing wine was employed consistently by the year 300 A.D. Up to that point, a number of other woods and materials were also used. Amphora, a clay vessel, was used to ferment, hold, and transfer wine; however, there are oxidation issues and other phenolic compounds that do not improve the wine character and may degrade the final product.

In place of oak, other types of woods were also employed. Palm wood was noted by the Greek historian Herodotus as used in ancient Mesopotamia. This wood is all too hard to fashion and all too porous. Chestnut, Pine, Redwood, Black Locust (also known as Acacia), and Rauli woods have all been used at one point or another; however, the same issues arise. Woods too porous allow for oxidation or spoilage; woods too harsh in natural tannin change the final outcome after fermentation and aging; and woods that impart a musky scent, yellowish tinge, or harsh phenolic compound ruin what began as a great vintage.

The wine barrels we know today have been cloned and grown for their specific benefit to wine. The word phenolic, which will be repeated when discussing oak, refers to the natural chemical compounds in the wood that can affect taste, color, acidity, aroma, and mouthfeel. The primary oak used in quality fine wine production is Quercus Alba. This type of white oak is easier to bend under heat to form barrels, has

tighter grains for less seepage, and has better, more “sugary” phenolic compounds that lend depth to a wine. These flavors of vanilla, caramel, and spice notes are preferred by the consumer and the vintner. The roughly 2,000 years of practice with white oak have led us to what we see and taste in wines aged and fermented in oak barrels today.

Quercus Alba has a few family members: Quercus garryana is found in Oregon and Northern California and is a closer DNA match to the white oaks of Europe, namely Quercus Robur and Quercus Petraea. Both of these types of white oak are found and used in the great oak forests of France. The forests of Nevers, Allier, Limousin, and Vosges, to name a few, are some of the best sources of these woods. The most sought-after wood is Quercus Petraea which at one time was only found in the forests of Eastern Europe.

Due to two consecutive world wars and following the rise of the USSR, these forests were not accessible to the great wine producers of France and the genus had to be cloned for growth in France. Today, Hungarian oak is once again at the top of the preferred barrel choice of vintners worldwide. With regard to white oak, it is not simply the tree but the micro-climate and soil in which the tree is grown. So, even though you may find Quercus Petraea growing elsewhere, the wood from Hungarian forests produces the most desirable phenolic compounds and wood grains for aging wine.

With respect to other types of materials, amphora is used by some modern-day wine makers, as is Chestnut wood which is usually lined with a paraffin since the wood is too harsh in undesirable phenolic compounds. Acacia wood is used to give a lighter influence to wine than a white oak barrel. When stainless steel, glass, or food-grade plastic is employed, there is no other flavor addition; so these wines tend to be fruit forward with less depth of mouthfeel. Wineries have used the process of “chipping”

which is to place staves or toasted wood chips in the stainless fermenters to give the wine some phenolic notes. Chipping can save money and offer a slight oak influence, yet the practice was outlawed in the EU in 2006, and wineries that employ “chipping” there may suffer steep fines.

The cost of using oak can affect the final price of a bottle of wine. Barrels will give the vintner up to 60 months of use before going neutral, and, at that point, they only provide oxygenation for the purpose of softening the wine’s natural acids. A quality Bordeaux-style barrel will hold 59 U.S. gallons or roughly 283 750-ml bottles. These fermenters average in cost between \$1,000 and \$2,500 per barrel and more depending on the cooperage that produced the barrel. This is not a simple expense when a winery has 100,000 gallons or more in production. Yet to achieve the layering of flavor found in high-quality fine wine, white oak of the Quercus Alba family is the present-day preferred medium.

There are differences between American and French oak barrels that influence the final product. American oak has two to four times the lactones (the key to aroma in oak barrels as these are the cyclic esters found in the lactic oils of the wood). Most of these barrels are kiln dried for quicker production. The American oak is roughly two times more economical, and those phenolic compounds are bolder and more powerful than their EU cousin.

French oak barrels are more expensive because the wood is air dried in a lumber yard for up to three years before being formed into a barrel. This allows a complete leaching of the harshest



compounds and provides more of that vanilla influence in the wine. Modern production techniques are providing other options for producing wine with less oak integration, yet the influence of oak as a component of the wine experience is largely attractive to most wine consumers today.



*George Parkinson has been a member of the Court of Master Sommeliers, Americas since 2006. Presently he is the wine educator for Stony Run Winery in Breinigsville, PA where he teaches wine appreciation classes monthly that are open to the public. He is also the head bartender for the Union League of Philadelphia at The Old Guard House.*

*George resides in upper Bucks County with his family. He may be contacted at: gipark3@gmail.com.*