

ESSAY ON A BARREL

AND A MODERN HERESY!

As a winemaker in my 30's it was clear to me that I knew pretty much everything I needed to know about barrels. I mean I bought plenty of Allier didn't I...didn't that prove it!

Of course, I didn't really know much. And that is perhaps the point, most of us use barrels. We are all *familiar* with barrels. But do we really know much about them?

Barrels add oak flavor right? So that is probably their most important use. But we also use barrels to 'mature', 'raise' (elevation in French), 'age' a wine. So flavoring and maturing. And oxygen too. We know they also allow oxygen in to polymerize the tannins and that is important too (I certainly remember my Chem 101!).

But we know there is more to this than these simplistic ideas. But first, let's examine what we are trying to do and examine this word '*maturing*' or '*maturation*'.



MATURATION

It is an unclear term. May mean many things. The Cambridge dictionary allows the following meanings.

- *the process of becoming completely developed mentally or emotionally*
- *the process of **becoming completely grown physically***
- (in business / economics) *the process of a market , industry, etc. no longer growing as fast as it did when it was new*
- Collins English allows; *The maturation of something such as wine or cheese is **the process of its being left for a time to become mature.***
- ***the process of maturing or ripening***

The word implies a *journey*, to travel to reach its natural, intended end point, or a suitable end point. Interestingly, only one of these (ripening) implies a quality element, although to a winemaker the term *maturity* has a clear idea of an increase in quality to arrive at a wine's peak. So, in winemaking to allow a maturation process to occur allows the wine to journey towards an end point, to whatever the winemaker was intending.

Anything that is part of this maturation process is not accidental, it is deliberate, active and the methods to perform this are deliberately chosen. Whether this act simply be time, or another, different transformation.

'Perhaps' or even 'probably' it can be thought of as a quality journey, but we know it is certainly a deliberate, transformation step.

Now, to a winemaker several processes may permit 'maturation' to occur. It may be the secondary malolactic fermentation. It may be heat. It may simply be time. So, if I am allowing my wine to mature...it is not immediately / precisely clear what process I am referring to.

So perhaps the tool I am using gives a clue to what type of maturation we are intending.



BARREL

A **barrel** is typically described in dictionaries as.
[Cambridge]

- a large wooden **container** with a **flat top and bottom** and **curving sides that are wider in the middle**,
- the long part of a gun that is shaped like a tube,
- a large container, **made of wood, metal, or plastic**, with a flat top and bottom and curved sides that make it fatter in the middle,
- A barrel is also a unit of measurement of volume equal to 31.5 gallons (119 liters) or, of oil, equal to 42 gallons (159 liters).

[Oxford]

- *A cylindrical container bulging out in the middle, traditionally made of wooden staves with metal hoops round them.*

[McMillan]

- *a round wooden, metal, or plastic container with a flat top and bottom, used for storing liquids*

I have highlighted the relevant parts of these definitions to our discussion.

So, a barrel does not have to be made of oak, or indeed even of wood. It can have metal hoops, but not necessarily, this has simply 'traditionally be done' and presumably a non-traditionalist would not need to do this. Size is not a unique feature. It seems to have a flat top and bottom and it stores liquids.

A unique defining feature seems to be roundness and/or a bulging middle.

Note that none of these definitions refers to maturation, ageing or transformation. The only reference is to storage, which is a passive function. Nor incidentally does it necessarily hold liquids. Many barrels transported nails or butter.

Now what of these defining features is the reason a winemaker uses a barrel, as opposed to another type of container? Say one without a bulging middle, or one that is square.

And are these the unique defining features of a barrel of interest to a winemaker?

Let's ask what does a barrel do in winemaking...and most importantly, what does a barrel *uniquely* do that another container, say a stainless-steel tank, does not do?

A barrel - in a winemaking sense – performs four distinct functions.

- It **holds liquid**. This fits with dictionary definitions. Indeed, that was its primary purpose, to hold and allow easy transport of goods, including liquids, less fragile and more movable than clay amphora. But of course, holding and moving liquids is not a function unique to barrels – today many things perform this: tanks, bags, drums etc. So simply holding liquid does not in itself qualify something to be a barrel. It is simply an incidental, basic requirement. '*It must hold liquid...*' And frankly, I am yet to meet a winemaker who proposes to acquire new barrels simply to hold liquids.
- It **can impart oak flavor / aroma / tannins**. Not mentioned in dictionaries, aside from an incidental effect *if* the barrel was made of wood. And I also say '*can*' because in many cases (i.e. old barrels), they no longer do this and in fact these older barrels are used in preference to younger barrels precisely for this very reason – that they do *not* convey oak flavors / tannins / aromatics. I know of exceptionally high-quality German wineries that buy new barrels and deliberately 'waste' the oak flavors, in order to get a neutral barrel...because they don't want the oak flavor.

And oak flavors / tannins / aromatics can also be conveyed into wine by oak in stave, stick, ball, block, dust, liquid, or chip form...to do this does not require the oak to be formed into a barrel shape. So, a barrel *may* convey oak flavors, but this in itself does not define something as a unique function a winemaker requires a barrel to perform. So now my barrel '**MUST hold liquid and MAY (or may not) impart oak flavor / tannin / aroma...**'

- It **facilitates slow oxygen transfer**. Note that it just *facilitates* slow oxygen transfer, it does not *control* it. In fact, it is quite irregular in the amount of oxygen that may permeate through it. Now this is a critical function of a barrel...why put wine into a barrel that has spent its oak flavors? Because we want the slow absorption of oxygen to change, modify and improve the wine. To allow the wine to transform and mature into its intended form. Otherwise we'd simply put the wine into a more convenient container – like a stainless-steel tank for example, or simply bottle it.

Apart from MOx, today there are no other known ways of facilitating the slow oxygen transfer. SO PERHAPS THIS IS THE BARRELS UNIQUE PROPERTY.

So now our barrel “*MUST hold liquid, MAY (or may not) impart oak flavor / tannin / aroma and MUST facilitate slow oxygen transfer...*”

- Lastly, the barrel **conveys imagery**. This is an odd function and we will see why. The wooden, oak barrel has become a widely recognized ‘symbol’ of wine and more importantly, ‘high quality wine’ - as we don't put cheap, low quality wine in a barrel - so a barrel's image is - by usage – associated with and linked with high quality. Ironically, note that for these quality symbols to function, does not actually *require these symbols to in fact contain wine*. I know of many wineries where these symbols are left empty (various Chinese and even Australian wineries) or are filled with water (some Spanish wineries). Nor do these symbols have to account physically for the entire output of the high quality wine of a winery...a winery may need to use 1,000 barrels...but in reality have only 100 and these are prominently displayed for the visiting public to see. The visiting public don't actually care, they never count how many a winery has and compare that to the winery's output! So, curiously, the *symbolic purpose* of a barrel is to some degree *separate from its winemaking purpose*. Its symbolic purpose is not an intrinsic function of what a barrel does...it is valuable, but an unlinked and accidental function nevertheless!

So finally our barrel now “*MUST hold liquid, MAY (or may not) impart oak flavor / tannin / aroma and MUST facilitate slow oxygen transfer...and I want SOME to use for imagery*”.

So, we can see that our barrel's critical properties are not quite what we thought they were – the critical properties actually are that it must facilitate the slow transfer of oxygen. And to do this, in a practical sense, it must hold liquid.

It may also convey oak flavors / aromas / tannins, but this is not always required.

And we can see that its *physical shape* does not have any impact on its function. *Roundness* and a *bulging middle* are critical in the barrel manufacturing process, but this aside, impart no valuable, unique, or even useful properties to a winemaker so are irrelevant.

So, the winemaker uses a barrel precisely because he/she wants some development to occur in the wine. Some activity to occur. It is not a passive storage container. Nor is it the only way to expose wine to oak flavor / tannin / aroma.

Otherwise we'd simply bottle the wine 'as is' or use an inert stainless-steel tank.

So, a barrel is some form of active, transformational container. And the transformational ingredient is (slow) oxygen.

The word *barrel* can now be understood as one conveying precise meaning to a winemaker. It is an object that provides a valuable and unique function, the slow oxygen transfer, important in the maturation of their wine. 'Vessels', 'tanks' or any other word simply doesn't convey that meaning. If I use a barrel it is also immediately clear what maturation process I am utilizing.

NOW, A HERESY

A square cube, *holding liquid*, designed to *control the slow oxygen transfer*, to facilitate the maturation process performs precisely the *two unique functions of a barrel* the winemaker needs.

Therefore, a cube can – for a winemaker – be a logical barrel. It is in fact the modern barrel.



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FURTHER READING

This is a terrific article summarizing current knowledge of OTR and barrels. Maria Del Alamo-Sanza and Ignacio Nevares, 2014, UVaMOX-Universidad de Valladolid, Avda. de Madrid, '**[Oxygen Transfer Rate in Oak Barrels, Annual evaluation for dynamic oxygen intake and entry](#)**'.