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Mini Review

Does Time Improve the Quality of the Wine?

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Abstract

The quality of a wine depends on the quality of the grapes, as well as a rigorous wine breeding and winemaking in bottle. Given that all these various steps take time, one can wonder if time takes part as an active phenomenon in wine making.

Keywords: *Time; Chronological Aging; Biological Aging*

Introduction

From the grape to the tasting glass, many factors are involved in the making of quality wine: local climate, weather, soil composition, vineyard orientation, vine care, grapes harvest, winemaking, and aging in bottle; all operations that need to be carried out under the permanent control of the winemaker, and the regular tasting of the wine in bottle by the wine waiter, the connoisseur and the collector. The terminology used to describe the making of fine wines involves words like duration, right time, slowness, month, season, etc. However it suggests that time has a role during the wine making, a technical analyse of the different steps proves that it is not so.

Slowness as a virtue

A low quality grape never results in a great wine. Quality grapes will be obtained only under numerous and strict conditions:

1. The climate and a favorable weather are crucial: a mesoclimate offers the appropriate conditions to obtain quality grapes. Enough sun, but not too much: too much sun leads to too fast ripening of the grapes, which produces too much sugar in the grapes. Slow ripening is a key word for high quality, as for the grand cru of coffee and cocoa. For example, the Blue Mountain in Jamaica gives one of the best coffees worldwide, thanks to a very slow ripening at about 2200 m altitude. Slowness is not similar to long lasting, because the goal is not to play with time, but to allow the work of specific bacteria and the development of rich and complex bio-chemical reactions.
2. The vineyard orientation has a significant role; two neighboring plots often provide grapes that are different.
3. The soil and land composition gives the wine its taste and its character, depending on whether the soil is predominantly limestone, sandy, gravelly or otherwise
4. The varietal and the association of grape varieties are involved in the character and the typicity of the wine.
5. The vine must be over 30 years old; In fact, the number of years is secondary: indeed the main concern is the root development of the vine, because an important roots network reduces the water stress and it conditions a large and various nutrient absorption [1].

The maximum yield must not exceed 60 hectoliter per hectare. Limited yields favor aromas. For example, in 1992 the harvest of Petrus was less than 27 hectoliter per hectare [2]. Petrus is among the very few producers of prestigious wines, for which wine is not a business, but an art.

The winegrower follows a calendar of the various operations to make all along the year. For example, cut of the vine shoots and fight against specific parasites. These operations have to take place according to the state of the vine, more than a strict respect of a calendar.

6. The ripening of the grapes must be slow and incomplete. Excessive ripening leads to insufficient acidity, too much sugar, whereas insufficient maturity produces excessive acidity, that leads to lack of sugar and therefore alcoholic degree too law. The harvest must be done at the right time, that is to say, when the grapes are almost ripe, usually during the month of October.

Right time and slowness of ripening does not mean that these operations are depending on time): they just have to take place according to the quality of the grapes.

The wine breeding

The quality of the grapes is a necessary but not sufficient condition for the achievement of a fine wine. The "vin de garde", which is meant for aging, must be very tannic; the maceration lasts between 2 and 3 weeks at 25 to 30°C [2]. It lasts only a few days for early wines that are consumed young.

The winemaking is the second step of wine breeding. During at least two years, the wine is kept at constant temperature in oak barrels or in steel tanks in which winemaking begins:

- The alcoholic fermentation during which a yeast convert the sugar to alcohol and secondary products that contribute to the taste and aroma.
- The malolactic fermentation during which bacteria lower acidity and leads to wine softening.

The durations of maceration and fermentation do not mean that time has an active role: instead, maceration and fermentation favor chemical reaction that are long and complex for the breeding of great wines. At this step, the vinification is completed. Next step is aging of the wine in bottle, about which it's useful to explain what is aging, and more precisely the difference between chronological aging and biological aging.

Chronological age and chronological aging

Contrary to a received idea, aging is a concept instead of a phenomenon. For example, a disease is not caused by the aging, instead, disease is a cause of aging. Diseases are caused by genetic heritage, way of life, etc. not by aging.

The Romans were dating the wines by using the names of the two consuls who held office that year, and whose names were inscribed on the amphorae; it was called the consular year. In life of Sylla (138-78), Plutarch (46-126) wrote: We drank a wine forty years old (35, 1) [3]. "A forty years wine" does not mean that it was a good wine according to our current criteria. The wine chronological age is how many years since the harvest (Figure 1). The year of harvest printed on the label let us know if it is a great vintage or not. But it does not say anything about the life of the wine, if it was carefully preserved, and if the wine is good or not. Ultimately, the information is very poor. For example, the chronological age of red Burgundies and red Bordeaux harvested in 1990 increase at same speed: they have the same chronological aging. Although it's an exceptional vintage, the quality of these vins de garde is not guaranteed until they are tasted.

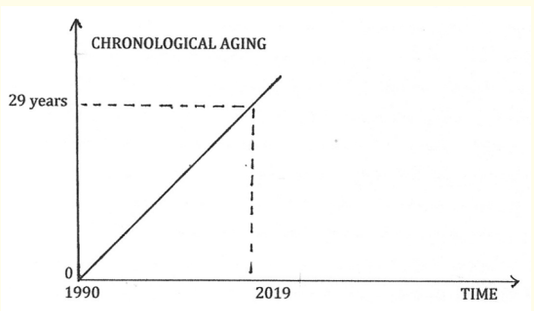

Figure 1: *The bisector line is not informative.*

Biological age and biological aging

The age of an individual corresponds to his chronological age. Medicine introduced the concept of biological age which takes into account the health status of the individual. We have introduced the biological aging in order to give a more precise description of the processes [4].

The chronological aging and the biological aging don't have the same meaning: biological age and biological aging are much more informative, insofar as they are related to quality.

At this stage of the production, the wine is too young to be drunk right away. Given its potential qualities, the wine is meant for aging, that is to say to open out, "se bonifier"; a positive meaning of the word aging because it's about a potential improvement which is reserved to aging in bottle.

Compared to the wine chronological aging, the wine biological aging is another matter. It is determinated by the life of the wine and it is supposed to bring together all the expected qualities of a great wine, called its apogee (Figure 2). The curve is purely theoretical as well as the apogee between 10 and 15 years: an exceptional vintage can lead to memorable tastings well beyond 15 years. In 2002, the advice of Taillevent about red Burgundies and red Bordeaux harvested in 1990 was: "Let them age", while the advice about the same wines harvested in 1992 was: "To drink now", and about the red Bordeaux harvested in 1988: "It should already be drunk"! [5].

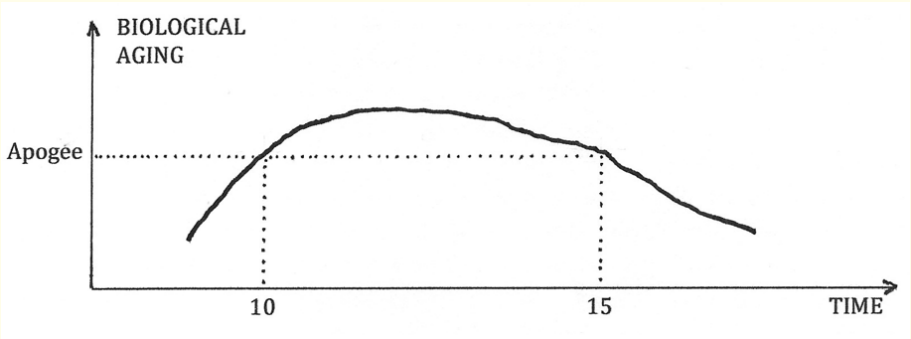

Figure 2: *Example of the apogee of a wine.*

The qualities are gradually improved by a slow and complex biological aging until the wine reaches its maturity: it requires no light, no vibrations, optimal temperature around 11°C, optimal moisture around 75%, no temperature variation, recorking after 20 to 25 years [2].

The biological aging leads to the development of specific characteristics: wine dress including color, aromas and bouquet, mellowness, velvety, taste richness, long taste: the caudalie, from Latin cauda which means tail, is a unit of time of about a second, that is used for the measurement of aromatic persistence [2]. The approximate measurement is done without a stopwatch, thanks to a slow mental counting. During its apogee, the wine has temporarily reached its highest level of quality.

What is behind time and slowness ?

Let's return on five out of the main conditions for producing a great wine:

- Minimum age of the vine: A good network of roots is a condition of a rich nutrient absorption.
- Slowness of ripening: It is necessary for a juice of high quality.
- Long maceration: It allows the development of tannins, of red coloring, and first aromas.
- Vinification during 2 or 3 years: The sugar is converted to alcohol and the acidity is lowered by bacteria.
- Aging in bottle: It's a complex and slow improvement of the wine towards its apogee.

The conclusion is that each step of wine making has its specific requirements; the alleged role of time and slowness are purely imaginary: instead, wine making needs much care all along a complex process.

Conclusion

The great wines, all the more the vin de garde, result from favorable natural conditions and rigorous care brought to the vineyard, the grapes and the precious liquid, in order to allow the slow development of reactions of a tremendous complexity.

The description of the process of wine making shows that time as such does not play any active role. This œnological illustration confirms that time is not a phenomenon.

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