



WORDS CLIVE HARTLEY

MAKING SENSE OF SMELL

SMELL, or to put it another way, our olfactory ability is a poorly trained sense. In comparison, man's best friend, the humble dog, has a much better chance of enjoying a subtle pinot noir than his master with an olfactory epithelium about 20 times larger. However, not many dogs are interested in becoming masters of wine, although I did once find a cellar pooch in the Rheinhessen that appreciated a good drop of pinot noir.

Wine contains several hundred aroma compounds and these can be detected by our olfactory epithelium, depending on their volatility. We can compensate for our poor sense of smell in a couple of ways. The volatility of an aroma can be increased by having the wine at the right temperature and not too cold. We can also warm the wine up in our mouth and drawing/sucking air through it also increases the aroma. Holding a hand over the glass and shaking it is another technique.

Aroma comes mainly from four sources. The grape or blend of grape varieties, its fermentation, the maturation of the wine prior to bottling and finally bottle aged aromas. The term bouquet is sometimes used instead of aroma when referring to winemaking or bottle aged smells. Another way of describing these aromas is to group them under the headings: primary (fruit), secondary (winemaking) and tertiary (bottle development).

There are occasionally some unexpected sources of smells; take eucalyptus for example. When you smell eucalyptus in a red wine you are identifying the presence of 1,8-cineole (eucalyptol). A survey, conducted by the Australian Wine Research Institute (AWRI), of 146 commercial red wines in Australia showed that 40 per cent of wines had detectable amounts of eucalyptol so it is a fairly common aroma. This compound is also linked to mint, medicinal and camphor

aromas. AWRI documented that eucalypt trees in the close vicinity of the vineyards, often planted as wind breaks, increased this aroma. It's probably through MOG (matter other than grapes) being fermented. In other words, eucalyptus leaves caught up and fermented in grape bunches when they were machine harvested. It doesn't take a lot of leaves to make a difference. It's not only eucalyptus trees; leaves in general can also affect aroma. The inclusion of grape leaves and stems in whole bunch ferments have also been associated with increases in rotundone, which can produce a strong pepper aroma in wines. Not all aromas are welcome. Parts of the eastern US and Canadian vineyards can suffer from attacks from Asian Lady Birds. When this insect meets its maker it emits a body fluid with odours described as similar to rancid peanut butter and rotting spinach, which can contaminate a wine.

Smell derived from the grapes either comes initially from the skins or flesh. They include the well-documented methoxypyrazines, which contribute, in general terms, herbaceous or vegetal notes. It is isobutyl-methoxypyrazine (IBMP) that gives sauvignon blanc its green capsicum or gooseberry aroma. Whereas isopropyl-methoxypyrazine (IPMP) comes across as the stronger cooked or canned asparagus aroma. IBMP can also be found in some cooler-climate cabernet sauvignons.

Monoterpenes are another group of grape-derived aromas. These compounds are found in citrus fruits and flowers. Aromatic wines that display floral, rose petal, lychee and citrus aromas, such as gewurztraminer, muscat a petit grains and riesling, contain higher levels of monoterpenes. The compound linalool gives us citrus and floral aromas, while

geraniol provides the rose petal. Lychee comes from a compound called cis-rose oxide. These delicate aromas and flavours can be masked by heavier diacetyl (butter, cheese) produced by MLF, which is one reason why you don't see MLF used in these grape varieties. The monoterpenes are unstable in an acidic wine environment and dissolve away over time leaving tertiary aromas to develop. As well as age affecting the aromas, the more alcohol a wine carries the less space there is for these delicate monoterpenes.

Complex and intriguing aromas are what we all chase in a wine.

On the winemaking side, aromas can be modified, exaggerated or created. During fermentation ester compounds are created. These fruit and confectionary aromas often dissipate quickly but can still be seen in some young white wines. Isoamyl acetate is one ester commonly encountered, which is identified by lolly, banana aromas. Malolactic fermentation (MLF) is where malic acid is converted in a secondary fermentation to lactic acid by the presence of lactic acid bacteria (principally *Oenococcus oeni*). MLF de-acidifies the wine, so it is particularly used with red wines. Chardonnay also undergoes MLF in barrel. Wine also contains citric acid and it is this acid that is converted to acetic acid and diacetyl during the malolactic fermentation. The latter compound provides us with the nutty, buttery and butterscotch flavours, which may or may not be desirable.

Continuing on with winemaking aromas, vanillin is the natural constituent of vanilla

and is also found in toasted oak barrels, which explains how vanilla bouquets develop in wine. When you get a toasty note in a red wine it is acknowledged that this comes from the oak maturation. The chemical marker for this is furfural, which is released through barrel toasting, but toast comes up again in bottle aged riesling. Toast here is an aroma that increases with age and indicates a slow natural oxidation. While we are on the subject of riesling, some wines produce kerosene notes, a smell, which can be totally alarming to new wine drinkers. 1,1,6- Trimethyl-1,2-dihydronaphthalene or TDN is the compound that is responsible for kerosene or petrol. TDN can develop very quickly in wine and has been shown to increase when grapes are exposed to warm temperatures or high degrees of sun exposure. It could also be influenced by poor (warm) storage conditions.

Barnyard is another Dr Jekyll and Mr Hyde character, providing for some the complexity of a great red, or one of the precursors in identifying the fault *brettanomyces* (a yeast called *dekkera bruxellensis*). Medicinal and elastoplast are two other brett related aromas. Historically brett dates back to its discovery in 1904 when it was named as British Sugar Fungus due to being very commonly found in British beer. Brett is found in wineries and infects wine barrels. The yeast strain converts phenolic acids in the grape must and wine into 4-ethylphenol, which gives the medicinal and elastoplast aroma.

Complex and intriguing aromas are what we all chase in a wine. A neutral smelling, vaguely grapey aroma cannot be classified as good quality, at best, it's acceptable. Understanding the possible origins often makes sense and leads to greater enjoyment of wine. 