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FAULTY & UNDRINKABLE

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It's that cold, stomach-wrenching, sinking feeling that almost every wine lover has experienced: the realisation that the wine in your glass, which you have been patiently nurturing in your 'cellar' in the anticipation of the complex delights of full maturity, is undrinkable. There are many faults which may affect wines: not all are totally devastating, and some will just reduce enjoyment. Perhaps the most feared is the musty reek of a damp sack from a so-called 'cork-tainted' wine. The cork may, or may not, be responsible, as discussed later. Another fault, that mostly affects red wines, is the Elastoplast or farm-yard odours created by the actions of the 'rogue' yeast Brettanomyces. Whilst it is true that the frequency of some faults and taints have declined in recent years, others have increased and issues that were once unheard of now affect many wines, including smoke taint which is very much on the rise in New World countries. In this article I will briefly consider aspects of just two of the most serious faults: so-called 'cork taint,' and lightstrike.

The Musty Odours of So-Called 'Cork Taint' (Haloanisole Contamination)

It's October 2019, and I'm in the classic surroundings of Brown's Courtrooms in London's Covent Garden. The building is now a restaurant and bar and people are no longer judged here, except perhaps by service staff. In the upstairs function room there is a small wine tasting taking place, held by a highly regarded UK importer. I've arrived early and the hosts have opened the wines, but not yet assessed them. I begin tasting. The very first wine reeks of wet sack and mushrooms. The ninth wine is really musty—so-called 'corkiness' at it very worst. Wine number eleven is affected too, albeit to a lesser extent. I ask for another bottle of each of the tainted wines: these are fine, indicating that, on this occasion, cork is almost certainly the culprit. Later in the tasting one of the reds suffers the same fate: a total of four of the 53 wines shown have issues.

As I leave the building, I reflect that, notwithstanding all the measures taken by the cork industry and others to combat the problem, there are far too many haloanisole affected wines yet to unleash their sadness; they are lying in wait in wine cellars, on the shelves of retailers, and in glasses on dining tables.

Many wine lovers consider so-called 'cork taints' to be an industry specific problem. However, the taints may be found in many other products including beer, coffee, tap water, bottled water, over-the-counter and prescription medicines, chickens, sultanas and bagged ready-to-eat carrots. There are three main compounds involved: 2,4,6-trichloroanisole (TCA), 2,3,4,6-tetrachloroanisole (TeCA) and 2,4,6-tribromoanisole (TBA). A concentration of just 1-3 parts per trillion (ppt) of any compound is sufficient to have a severe impact upon an affected wine, muting the fruit, and above 4 ppt the damp hessian and musty aromas overwhelm. By way of analogies, 1 ppt is equivalent to 1 grain of wheat in 100,000 tonnes or, from an alternative viewpoint, a single second out of 32,000 years. However, it is possible that young people are becoming desensitised to related taints—they have got used to their presence in many foods. Speaking to the San Francisco Chronicle's wine critic Esther Mobley in 2018,[1] Lindon Bisson, professor emeritus at the University of California, Davis gave the observation that when she started teaching some 30 years ago maybe one student in a 100, or even 200, could not detect TCA. "But then, over time, it started to be higher and higher percentages of the students." Bisson suggests that the reason was the contaminated bags of ready-to-eat carrots that are a student favourite.

The implication of cork closures in musty taints in wines is well documented, but particularly during the last two decades of the 20th Century there were numerous chais and cellars in several countries contaminated with haloanisoles, and there are still a few around today. Wines produced in contaminated cellars are readily tainted. TBA, which was not identified in wine until 2004, is not naturally found in corks and any presence in wines results from an external contaminated source. Several famous Bordeaux properties suffered contamination in the 1980s and 1990s, often consequential to renovations that had included the installation of new joists, purlins, and rafters. Disastrously the new timbers were treated with wood preservatives based on chlorophenol or bromophenol compounds, which are the direct precursors of haloanisoles. The level of chloroanisoles in some affected Bordeaux wines in the period 1986 to 1996 were up to a staggering 360 ppt—a hundred times aroma and taste thresholds! Many production and maturation facilities had to be rebuilt. Today architects are careful to avoid treated timbers in winery design, as exemplified by the magnificent chai at Château Talbot.

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Contamination was also discovered in several wineries in California and in Chile in the 1990s and first decade of this century. From 2004 until 2006 Viña Errázuriz, a highly regarded producer based in the Aconcagua Valley in Chile, was faced with the realisation that parts of the beautiful old cellar at Panquehue was contaminated with 2,4,6-TBA,[2] prompting a strident eradication programme.

Haloanisoles are transformed from halophenols, mainly by filamentous fungi. The industrial use of halophenols began in1936 when pentachlorophenol was introduced as a wood preservative by the companies Dow and Monsanto. For many years post World War II, most soft wood timber was treated with chlorophenol to prevent the growth of fungi which impart a blue or purple stain to the wood. Halophenols were also used as pesticides and herbicides. 2,4,6-tribromophenol, the precursor of TBA, remains widely used as an intermediate in the preparation of flame retardants, timber preservatives, and fungicides. It has been commonly used as a treatment for wooden pallets, with disastrous consequences.

It is a sobering thought that TCA and other chloroanisole contamination of corks and wines almost certainly did not exist before World War II, although TBA contamination possibly did. Although Professor George Saintsbury refers to a corked wine in his classic work Notes on a Cellar Book published in 1920,[3] we cannot know the precise fault noted, but it is most unlikely that it was TCA. Even as recently as the 1970's, very few bottles of wine were perceived as 'corked.' Christian Vannequé, former head sommelier at Paris's La Tour d'Argent Restaurant recalls, that in the 70s he and staff would open between 800 and 1000 bottles a week, but rarely found more than four or five of them 'corked.' He says that if there were problems it was almost always with wines from the 1960s, rather than those from the 1930s, 40s or 50s. 'If you had a problem with a 1929 wine, for example, it was never cork taint. It might have been a crumbly old cork...but it wasn't corked.'[4]

There are several pathways to the formation of TCA that account for its presence in cork. Historically, chlorophenols were used as fungicides in cork oak forests, such use continuing until the 1980s. The activity of filamentous fungi would then convert the chlorophenols into chloroanisoles. The boiling of corks in municipal water containing chlorine, which was very often recirculated, and the chlorine bleaching process used historically, were both without doubt major contributors to the formation. The use of municipal water in the boiling process is not now permitted by the 'SYSTECODE' quality assurance system for the cork industry. Chlorine bleaching compounds are no longer used either, having been replaced with baths of hydrogen peroxide and ammonia.

Today, following 20 years of R&D and the introduction of new processing and analysis procedures, the major cork closure producers say that no TCA is formed during the production processes. Amorim, the world's largest cork manufacturer, now claims to have eliminated detectable TCA from every cork it sells.[5]

If you are faced with a haloanisole-tainted bottle, it is sometimes possible to partially clean-up the wine by inserting some Saran wrap (cling wrap) into a bowl and swirling the wine around. The product is made with polyethylene. The problem is that although over 96% of the taint compounds can be removed, to achieve this takes three days, by which time the wine is oxidised! Some desirable aromas and flavours are also stripped from the treated wine. So down the sink it is!

Lightstrike

I remember the evening well, and the horror haunts me today. It was a small party for my birthday, thrown by my new girlfriend who was not really into wine, but knew that it was a way of life for me. She had been given some years earlier a bottle of Louis Roeder Cristal. The glasses were poured with ceremony. The wine looked too deep in colour, but nevertheless I raised the glass to my nose. Skunk, garlic, and cooked cabbage! All the classic symptom of lightstrike. Cristal is bottled in clear glass, but the bottle is wrapped in orange coloured cellophane, which filters up to 98% of damaging UV light. As you may imagine, my girlfriend had removed this before storing the wine in her kitchen! The relationship was doomed.

Lightstrike is an all too frequently encountered fault, caused by the formation of undesirable volatile sulfur compounds consequential to exposure of wine to light, particularly ultraviolet light, but also visible light at the blue end of the spectrum. It mainly affects wines bottled in clear glass (flint) bottles, and is

most likely to affect sparkling wines, and white and rosé wines. There is a deepening of colour, sometimes considerably so. The nose may exude odours of sulfur and garlic. There can also be aromas of wet wool or wet cardboard. Red wines have a higher degree of protection due to their levels of phenols. Lightstrike also affects milk, and beers—thankfully most ales are bottled in brown glass.

Whilst there can be little doubt that wines can look tempting in clear bottles, they can be hugely damaging. The photo on page 8, taken in a supermarket in France, shows two bottles of Premier Cru Classé Sauternes of the same vintage. The bottle on the left has been taken from the shelf; the bottle on the right is newly removed from the carton.

Interestingly, Louis Roederer was the first major Champagne house to switch to brown bottles (for wines other than Cristal) in 2010; since then several other houses have followed suit including Piper-Heidsieck and Drapier, so it would seem that at last the Champagne industry is beginning to take the problem seriously.

Lightstrike is caused by exposure to UV light and visible light at low wavelengths. Critical wavelengths are 340, 380 and 440 nm.[6] It is generally accepted that clear glass filters just 10% of UV light, green between 50 and 90% and brown from 90% up to 99% at these wavelengths. There are some variances and, particularly with clear glass, 'thicker' bottles filter out more UV light. There has been a growing movement to bottle wines in lighter-weight glass—this has been primarily led by environmental concerns, particularly with regard to the impact of transporting additional weight. In fact, white wines packaged in clear glass bottles can be affected after just 3.3 hours exposure or, to the same degree, in green bottles after just 31 hours.[7] Sparkling wines will be affected by exposure in the same time in clear, or 18 hours in green, glass.

The stinky volatile sulfur compounds are produced from riboflavin and amino acids by a photochemical reaction with light. Riboflavin (vitamin B2) is a very photosensitive compound, and has strong absorption of UV light. It occurs naturally in grapes. During the bottle-ageing of Champagne and Traditional Method sparkling wines, prior to disgorging, sulfur containing amino acids are freed from yeast cells as part of the process of autolysis. If exposed to UV light, the production of dimethyl disulphide which smells of boiled cabbage, or garlic is particularly likely. To make matters worse, bubbles amplify the sensory perception of the off-aromas.

In conclusion, care should be taken when buying white and rosé wines, sweet wines or sparkling wines in clear bottles. If possible try to have a new case opened, and when taken home keep away from light. Exposure to light also depletes sulfur dioxide levels, and increases oxygen uptake, so the wines will age prematurely. I have found the highest incidences of light struck wines in restaurants that have wines on display, and are lacking rapid turnover.

There is no treatment for lightstrike—the fault is irreversible. So once again, down the sink it is.

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