How to stopper a wine bottle

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The world's wine producers spend a lot of time asking themselves and each other how to persuade more people to drink wine. And yet they continue to sell the vast majority of their production in such a way that it cannot even be opened, let alone consumed, without a special bit of equipment, great patience and dexterity, and acceptance of a considerable failure rate. The continuing use of cork, a cylinder of tree bark, to stopper wine bottles is in many ways extraordinary - especially since a growing body of scientific research suggests that a crown cap (as on a beer bottle) or screwcap can do the job just as well (provided fill heights and sulphur dioxide dosage are correct). Many producers choose not to switch to easier, more reliable stoppers because market research suggests that so many consumers are wedded to corks and corkscrews as part of the wine drinking experience.

I too love the 'pop' sound of a cork being pulled (and, especially, the popping of a champagne cork which, restaurateurs report, can have an instant effect on other diners), and I love the idea that cork is an ecologically sound material with a long tradition. But I feel even more passionately about how difficult some corks are to extract (especially from Italy's narrow bottlenecks), how they can eventually crumble and fatally let in air, and how frequently they are affected by 'cork taint' and result in completely spoilt 'corked' wines. Cork is a unique material in that it is light, elastic, inert, (i.e. does not normally react with the wine), and shouldn't let liquids out or air, wine's enemy, in (although see Bottle maturation: colour and ullage). Once it is lodged in a bottleneck and absorbs wine it should offer a seal that is as airtight as is necessary.

Crystals on the bottom of a cork are not sinister, just harmless tartrates deposited by wine's naturally high level of tartaric acid. Some mould on the top of a cork is not necessarily a bad thing either as it is probably the result of the cellar rather than the wine (I still remember the glory of a Ch d'Yquem 1945 from under a cork that was so mouldy it was visibly moving). If a cork is very damp at both ends, it may have allowed some wine out and, more dangerously, some air in. If you notice that a bottle is leaking, or a cork fits so loosely in a bottleneck that it can be moved, it is worth extracting the cork and replacing it with a tighter one as soon as possible, after checking that the wine has not been oxidized by taking a small sample.

'Corked' wine

A wine is said to be corked if it comes into contact with a tainted cork. Cork contains moulds which, when the cork is cleaned with chlorine-based products, form a compound known for short as TCA (see Julia's compendium of wine faults). This infection (which incidentally can come from sources other than corks) causes a wines to be 'corked' and smell of mould, robbing it of its fruit on the palate. The effects of TCA, often called 'cork taint', vary from mild suppression of a wine's fruit (virtually undetectable by anyone other than the winemaker themselves who knows how the wine should taste) to a moulsy aroma so strong that the wine is undrinkable. The nastiness of the smell often increases as the wine is exposed to air. There is no remedy for 'corkiness' (which has nothing to with fragments of healthy cork floating in a glass; they are harmless and should be scooped out). Wine producers' exasperation with this phenomenon explains the recent increase in the use of synthetic corks and screwcaps.

Screwcaps

Screwcaps provide the perfect seal – sometimes too perfect as they can sometimes lead to reduction, a sort of cabbagey/veggy stink related to a lack of oxygen. Many people find them aesthetically a turn-off, and we still do not know enough about exactly how different fine wines will age for many years under screwcaps to be able to give very precise advice about them. The reduction problem is likely to disappear as more research is done into different bottle fill levels, various doses of sulphur at bottling and using gas-permeable wadding inside screwcaps to allow tiny amounts of oxygen into the bottle.

So far it seems as though screwcaps (of which the dominant brand, owned by Alcan, is called Stelvin) are much more effective than other stoppers at retaining the natural fruitiness of wine, so seem particularly suitable for aromatic wines such as Sauvignon Blanc and Riesling. Their effects on oak-aged wines which have already been exposed to a certain mount of oxygen in the ageing process is less clear cut. Producers of top quality reds have doubtless been experimenting privately with screwcaps for some time but very few of them have so far presented their wines on the marketplace thus stoppered – although New Zealand and then Australia are leading the advance. It seems likely that such wines will age differently under screwcaps than under natural corks.

One thing is sure: screwcaps are generally used by producers anxious to maximise the quality of the wine encountered by their customers. Mild TCA infection undetectable to most consumers but resulting in a substandard wine is what they fear most.

Natural corks

It should be said that at long last the dominant producer of wine corks, Amorim in Portugal, is worried about the incidence of TCA and has been working hard to reduce it. We are currently seeing a race between screwcaps' advance and natural corks' recuperation.

The flashiest, most expensive corks can be up to 6cm long. An absence of natural defects indicates high quality. Although you should be wary of a producer that professed to have no problem at all with cork taint, these longer and purer corks do have a lower incidence of TCA.

Some high quality producers such as those at Ch Mouton-Rothschild however have deliberately reduced the length of their corks in order to prevent the cork from absorbing too much wine and lowering the level of wine in the bottle, which can age the wine prematurely.

The cheapest and least elastic corks are short, sometimes just 2.5 cm long, and made from cork agglomerate, little cork chips stuck together, reminiscent of soles and notice boards.

There are also special corks which have been treated to virtually guarantee an absence of taint. The DIAM system, produced by Oeneo, uses supercritical carbon dioxide, as used in the production of de-caffeinated coffee. Amorim's ROSA system uses controlled steam distillation to almost eliminate the incidence of TCA. Research is continuing into using these systems for whole, natural corks.

Champagne corks are a special case. Before it is hammered into a bottle, a champagne cork is too wide to be punched out of a single thickness of bark so a champagne cork is made up rings of agglomerate with disk of natural cork on the end in contact with the wine. (After about five years squashed into a bottleneck, the cork will be definitively mushroom-shaped – a useful clue to when a sparkling wine was disgorged.) Some sparkling wine producers, notably Moët & Chandon's Australian enterprise, known as Green Point in the UK, have abandoned natural cork entirely and have begun to sell their wines under the crown caps used to stopper the wine during the maturation process.

Synthetic stoppers

These plastic 'corks' are usually produced as moulded or extruded plastic. They are much cheaper than most natural corks, and producers such as Nomacorc are hard at work trying to improve quality, but in my experience these ersatz products are often extremely difficult to extract and even more difficult to get back into a bottleneck. I am not a fan. It seems crazy to me to create synthetic copies of an already inconvenient natural product.

Furthermore, the first set of scientific tests on the effectiveness of various different stoppers at keeping harmful oxygen out and fruitiness in found that synthetic stoppers provided an effective seal for only a year or two at best.

Crown caps

The crown cap is used for the first stage of sparkling wine maturation, and has been shown to keep any wine in good condition for decades at Germany's Geisenheim Wine Research Institute - so much so that several German wine producers, like the sparkling wine producers referred to above, are closing their bottles with crown caps.

These need special equipment too of course – a bottle opener – but these are much cheaper than a corkscrew.

Other stoppers

Since screwcaps are neither beautiful nor luxurious, work continues on developing alternatives such as the Vinolok glass stopper (a smart-looking, reusable thing reminiscent of old-fashioned pharmacies) and the thick plastic Zork developed in Australia.

I for one find it hard to believe that we have reached the end of the road. Surely it is not beyond man's ingenuity to come up with an attractive, effective, wine-specific stopper?