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Electricity Turns Cheap Wine into a Fine Vintage

We're all aware of the story of Jesus turning water in fine wine at Cana. Well, my knowledgeable electroplater/anodizer readers who are familiar with use of electricity, according to recent research you can become "Jesus-like." You will not be able to turn water into wine but the claim is that with passage of the proper current, plonk (cheap wine) can be turned into a fine vintage.

Backed by a decade of research with results published in a peer-reviewed journal[1] and having passed the ultimate test-blind tasting by a panel of wine experts, efforts by Xin An Zeng and his colleagues offer promise. Stephanie Pain reports, "The food industry has experimented with electric fields as an alternative to heat-treating since the 1980s, and ten years ago Xin An Zeng, a chemist at the South China University of Technology in Guangzhou, decided to see what he could do for wine. Early results were promising enough for Zeng and his colleagues to develop a prototype plant in which they could treat wine with fields of different strengths for different periods of time."[2]

The researchers passed a raw red wine between a set of titanium electrodes to which they applied AC at 0 - 900 V/cm. The flow was varied to expose the sample to residence times from one to eight minutes. They report, "An optimum treatment, with electric field 600 V/cm and treatment time three minutes, was identified to accelerate wine aging, which made the harsh and pungent raw wine become harmonious and dainty. HPLC and GC/MS combined with routine chemical analysis methods were used to identify the differences between the treated and untreated samples."[1]

Analysis revealed some significant chemical changes. Most obviously, there was a marked increase in reactions between alcohols and acids to produce esters. This led to a reduction in concentrations of the long-chain alcohols known to be responsible for nasty odors and a burning mouth feel, while the increase in the concentration of esters boosted the aroma and the perception of fruitiness. Two other good things happened: the breakdown of proteins produced free amino acids that contribute to taste and there was a noticeable reduction in the levels of aldehydes, which are responsible for off flavors. Too high a voltage and too long a time resulted in plonk worse than the original, so one has to be quite careful about operating conditions.[2]

Over the years, inventors have come up with dozens of widgets that they claim can transform the undrinkable or bring the finest wines to perfection without the long wait. There's little scientific evidence that most of them work. Here are some reported by Stephanie Pain:

Ultrasound - Last October saw the launch of the Quantum Wine Ager which is based on ultrasonics. Experts say ultrasound might increase some reactions but a lot of rigorous experiments must be done before concluding that it works.

Undersea Cellarage - Champagne house Louis Roederer has consigned several dozen bottles of champagne to the ocean floor, where it speculates the cool water and gentle rocking by currents will accelerate aging. The verdict on this is that by lowering the temperature, you slow down chemical reactions, so storage in cold water will slow the aging process. Corks are permeable to oxygen which helps aging. While in water, no oxygen will enter the bottle.

Gamma Radiation - According to Chinese researchers, an hour's treatment improved the flavor of new rice wine. In Canada the technique has been used to get rid of "ladybeetle taint" - nasty off flavors that result from ladybeetles (ladybirds) being pressed along with the grapes. This sounds technically interesting, but it's doubtful that consumers are ready for irradiated wine.

So, back to use of electricity. There are good commercial reasons why winemakers would love to get their hands on a speedier alternative, especially in places like China where the industry is young and booming. It would allow them to get their wines into the shops faster to meet ever-increasing demand, and cut the cost of storage. Five Chinese wineries have begun trials using electricity and reportedly this has French and American wineries watching closely. China is the world's fastest growing wine market and is trying to become a world-class wine maker as well. If the Chinese can figure out how to supply their own population with all the great wine they need, that leaves French and American wineries out of the picture.[3]

Some final notes

Reading the on-line comments to the Pain article provides some hilarity:

- Would a microwave do perhaps? Only if you stick a fork in the toaster at the same time.
- Forget about complicated titanium electrodes. Eight seconds in the microwave achieves the same result. Try it yourself - I've fooled many a wine taster.
- I like copper electrodes, takes the sulfur taste out at the same time.

Does this mean that aging of wines is over? Probably not. Many wine drinkers are firmly entrenched in tradition and would not accept artificially aged wine no matter how good. However, the technology is going to continue to influence the way wine is made, stored and enjoyed. One day, wine drinkers may have to choose between decanting or giving their wine a couple of minutes between the ol' electrodes, as one blogger puts it.[4] ***P&SF***

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Fact or Fiction

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A Bright Idea

2010 Bright Design Challenge

"LOUD PIPES AND CHROME!"

In its 11th year, the Bright Design Challenge has once again challenged students at the College for Creative Studies to push the envelope in creative design to create a concept 2015 Harley-Davidson motorcycle. Key design influences will include a "naked" air-cooled V-Twin engine, "naked" exhaust and will of course feature lots of chrome – some of the many features that Harley-Davidson motorcycles have become famous for around the world.

The Bright Design Challenge, sponsored by the National Association for Surface Finishing (NASF) is a lively, spirited design competition that connects young designers with major OEM design studios such as Harley-Davidson Motor Co. and Ford Motor Co. The winners of the contest receive scholarships on behalf of the NASF as the competition challenges students to balance style and function.

The students at the College for Creative Studies are putting their creative powers to work in designing a 2014 Harley-Davidson Concept Bike. The judging will take place on April 20 in Detroit – we'll keep you posted on the winners of this exciting program!

A special thank you goes to the Bright Design Challenge Sponsors. Without their support, we would not be able to continue this important program.

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