

For Better or Worse, Winemakers Go High Tech

By ALICE FEIRING

WINEMAKERS like to say wine is grown in the vineyard. But more and more of the wine produced in the United States is grown in the lab.

In the last five years, new treatments and additives ranging from smoky oak chips to tropical-flavored fermenting yeasts have spread through the 500-million-gallon-a-year American wine industry, whose epicenter is California. They have enabled winemakers to adjust the taste and texture of their products in response to consumer demand, obscuring the line between what is natural and what is not.

While these changes have helped minimize the wine industry's risks of a bad vintage and contributed to a 25 percent increase in annual domestic wine production over the last decade, they have also inflamed an emotional debate about whether winemakers are erasing the mystique of regional differences in wine.

"Anytime I taste a wine that has nothing distinctive about the place or the climate, I call that deception," said Roger B. Boulton, professor emeritus of viticulture and enology at the University of California at Davis, who opposes what he calls a creeping homogeneity in wine. "When everything becomes the same because of winemaking practices, that's a pretty sad day."

Nearly 90 percent of wine produced in the United States originates in California, and the state's wineries have good reasons to produce wines that they know will sell. The volume of imports has nearly doubled over the last decade and now accounts for more than 20 percent of all wine sold in the country, according to Impact, a trade publication of M. Shanken Communications. Many of those imports, particularly Australian wines, are also produced with the new techniques.

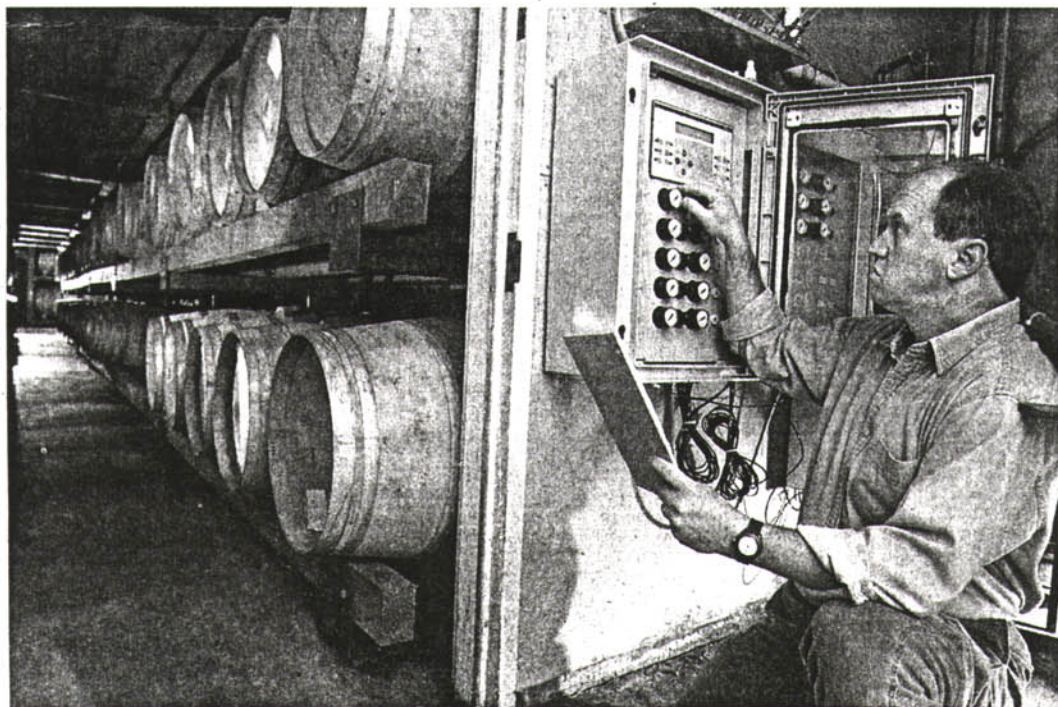
The Wine Institute, a trade group in San Francisco, estimated that the retail value of all wine sold in the United States was \$19 billion last year, up 5 percent from 1999.

A trend toward homogeneity in wine may be driven in part by a perception that influential wine critics like Robert M. Parker Jr. and magazines like Wine Spectator prefer particular flavors and aromas. Winemakers seeking good reviews may be exploiting new technologies not only for damage control, but also to shape their wines from birth.

There is nothing illegal about human intervention in the natural fermentation of wine. But the Bureau of Alcohol, Tobacco and Firearms, which regulates the industry, does impose some limits. It is not permissible, for example, to use food coloring to perfect a wine's color. And artificial flavoring cannot be added to replicate a particular taste, like that of blackberries.

What is allowed, however, is the use of oak, either raw or charred to varying degrees, which can impart flavors reminiscent of coconut, vanilla and coffee, for example. But while winemakers still use oak barrels, oak chips are increasingly used to save money on lesser wines — the chips are sprinkled into stainless steel vats to flavor a wine and give it an "oak flavor profile."

Adjustments are also permitted in the level of carbon dioxide in fermenting wine, which affects a wine's acidity and fruitiness. Adding unfermented grape juice sweetens the wine. Enzymes lock in color. Yeasts control the level of fermentation. Tannins, naturally occurring chemical compounds in



Photographs by Peter DaSilva for The New York Times

Michael Havens, owner of Havens Wine Cellars, uses a system that percolates oxygen bubbles through his wine as it ages in barrels.

grape skins and wood, are used in powdered form to further enhance a wine's taste and feel in the mouth.

Advances in yeast cultivation have now made it an ingredient for taste as well. Chardonnay producers looking for a toasty, buttery taste use a special yeast that enhances those qualities. Another example is a yeast that gives a banana flavor and aroma, originally introduced 10 years ago in Beaujolais.

Marty Bannister, the founder of Vinquiry, a wine analysis and consulting firm in Sonoma, Calif., said yeast was "the essential fermentation tool." But now, she added, "people also look toward it for flavor."

Diana Burnett, fermentation products manager at Scott Laboratories in Petaluma, Calif., a leading distributor of wine yeasts, said that in the past, winemakers relied on nature, soil and skill to make the best wine they could. Now, she said, they decide in advance what flavor they want, then choose the materials and tools they need.

CALIFORNIA's wine industry has embraced the technology of wine enhancement partly because ripened California grapes often have a higher sugar content than grapes grown elsewhere. Until recent years, the sugar was a chronic source of production problems for many winemakers — it contributes to high levels of alcohol in fermentation, which can kill the yeast prematurely and produce acetic acid, turning wine to vinegar. Wines with more than 14 percent alcohol, the normal amount, can taste hot and harsh.

High alcohol levels also raise the price to the consumer. A federal excise tax of \$1.07 a gallon is levied on wine sold in the United States that is no more than 14 percent alcohol. The tax is \$1.57 a gallon when the alcohol content exceeds 14 percent.

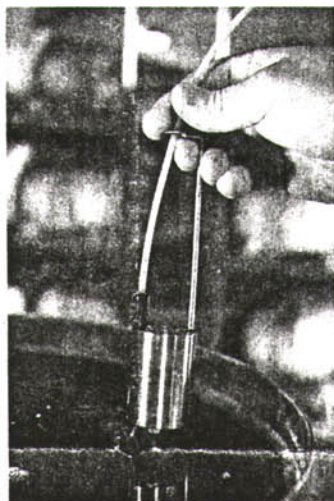
But now a technique called reverse osmosis, in which high pressure is used to separate the alcohol and acid from the wine, has helped many winemakers salvage crops that nature might have ruined. Use of the technique, originally intended to make non-alcoholic wine, has spread in recent years.

"The only thing to do with a batch of wine with acetic acid is to use reverse osmosis," said Lisa Van de Water, the founder and owner of Wine Lab, a consulting company in Napa, Calif., that specializes in emergency rescues of wines. "It's a godsend."

Many winemakers will not acknowledge using reverse osmosis, fearing that they will be perceived as having tampered with the wine. But even the best of them acknowledge that the technique is an important advance that has helped avoid calamities.

Steve Doerner, the winemaker at the Crustom Winery in Salem, Ore., known in the industry for his dedication to natural wine making, said he once had to resort to reverse osmosis. But he said such technologies should be used for disaster control, not for fine-tuning taste and texture.

"Whenever you take something out of the wine, you're changing it," he said. "And not



Devices called diffusers, inserted into each barrel, emit microscopic oxygen bubbles. Mr. Havens says the system reduces uncertainties caused by weather.

necessarily for the best."

Vinovation, a Sebastopol, Calif., consulting and production services company that introduced reverse osmosis, disagrees, saying the technique's application is much wider than just emergency use. Clark Smith, the president of the company, said it could produce "a better wine than you would have in the first place."

In 1997, Vinovation introduced micro-oxygenation, in which bubbles of oxygen are released into oak barrels used to store wine. This eliminates the need for a labor-intensive practice called racking, in which the wine is pumped out of one barrel into another to separate it from residue and yeasts.

Vinovation sold about 100 micro-oxygenation systems last year at \$2,000 each and said it expects to double sales this year. Michael Havens, owner and winemaker of Havens Wine Cellars in the Napa Valley, who produces one of California's most sought-after merlots, said he started using micro-oxygenation in 1996 after hurting his back during racking.

Mr. Havens defended the use of micro-oxygenation as just another part of modern winemaking. He said it helped to minimize the weather uncertainties that can make the difference between a good year and a bad year. "It is better to make conscious rather than random choices," he said.

Others, however, say the interventions have compromised the ethics of the industry, creating tastes and textures in wines that otherwise would not have them.

"People now think toasty oak is synony-

mous with a wine's taste," Professor Boulton said. "That is wrong. Should you add grape tannins as an adjustment? Maybe. But wood tannins? I have trouble with that." Techniques like reverse osmosis and micro-oxygenation "can make a good wine, but not a great wine," he said.

"If you have to resort to these methods," he added, "what does that say about your winemaking and grape growing?"

Winemakers say privately that the industry's effort to manipulate the taste and texture in wine reflects the influence of leading critics like Mr. Parker, whose rating scores can mean the difference between success and failure. Mr. Parker said he advocates minimal intervention in winemaking and does not consider himself responsible for homogeneity in wine.

"My scores have led to higher quality at all price levels, as well as to more informed wine customers," he said.

Enoligix, another Sonoma company that caters to the wine industry, has developed computer software that predicts how a wine will score in reviews even while it is still juice. Enoligix's founder, Leo McCloskey, said the software offered a noninvasive way to let winemakers know early if they have a potential hit. Mr. McCloskey said 65 wineries had bought his software, including leading boutique wineries like Diamond Creek, Ridge and WillaKenzie.

THE ability of new technologies to create critically acclaimed wines is evident in the prosperity of E. & J. Gallo Winery. The privately owned company does not disclose financial information, but with an estimated \$1.5 billion in annual sales, it is the nation's biggest winemaker.

After mastering the supermarket brand of wines, it has segued into the fine-wine category. Its highly rated 1996 and 1997 Estate Cabernets, for example, retail at \$70 a bottle.

Terry Lee, vice president for research and development at Gallo, said a successful winemaker now creates a focus group and finds what flavors the public wants, then produces them. Wine critics, in Mr. Lee's view, "are gatekeepers who have an influence on the buying public."

"I've heard the complaints that all wine is tasting the same," he said. "But that's because most people don't understand what wine is about and don't understand what a good winemaker is trying to do. People who make those comments are ignorant of the facts."

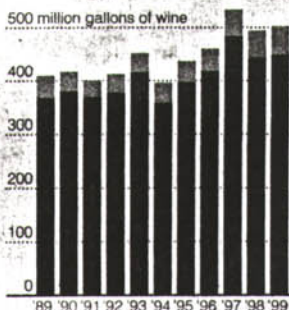
That assertion angers those who believe that fine wine is about the land and not about the laboratory. Mary Ewing Mulligan, co-author of "Wine for Dummies," said a result was a loss of distinctiveness.

"There should be a distinction between a beverage and fine wine," Ms. Mulligan said. "From the beverage viewpoint, it is easy to buy a technologically sound wine, just as it is orange juice. That's great. However, with fine wine it's terribly misguided." □

Fruit of the Vine

Nearly 90 percent of the wine produced in the United States originates in California.

■ California ■ Remainder of U.S.



Sources: Wine Institute, Bureau of Alcohol, Tobacco and Firearms