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WINE

SECTION D

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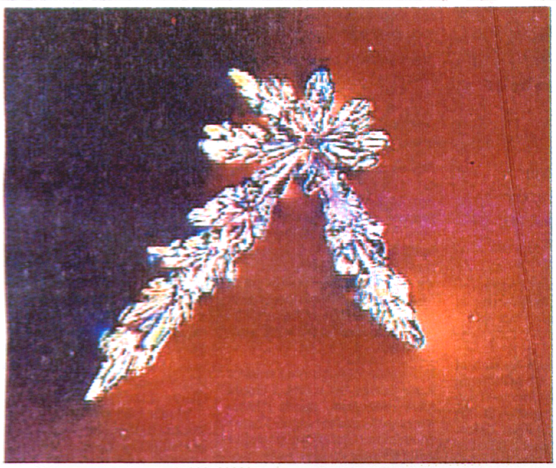
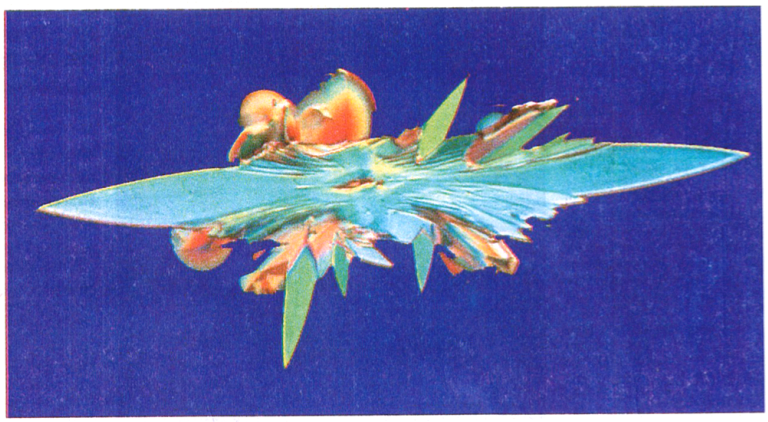
Scientist takes a close look at inner life of wine





An "interference" microscope captures crystalline forms in a 1982 Kenwood Chardonnay, left, and a 1979 Beaulieu Vineyard Georges de Latour Private Reserve Cabernet Sauvignon.

Photos by Sondra Barrett / Special to The Chronicle

Microscope reveals more than beauty

Sondra Barrett, a Forestville scientist, artist and educator, likes to enjoy wine the old-fashioned way – by drinking it. But she has also pioneered a unique way to observe the "inner life" of wine, by viewing it under a special microscope.

Using an "interference" microscope, a standard laboratory 'scope outfitted with light-refracting filters, Barrett, 62, studies and photographs the crystalline forms that appear after a drop of wine has dried on a slide.

Carol Emert
Uncorked

To date, her work has been noted mainly for its beauty or as a curiosity. But her findings provide an intriguing glimpse at possible uses for the microscope as a new diagnostic tool.

Barrett, a former cancer researcher with a Ph.D in chemistry, has pinpointed 26 forms in wine and has isolated what appear to be signature shapes of Chardonnay (pictured), Cabernet Sauvignon (pictured) and Merlot. Immediately after crush, the forms are tiny, simple and geometric; as the wines age they become stunningly complex. Then, as the wine heads over the hill, the forms become less reflective and withered, "like fallen leaves," says Barrett.

> "I didn't know anything about wine, but it was beautiful. It was not like anything I'd ever seen."
>
> Sondra Barrett
> *scientist*

"Form isn't accidental," she says.

Barrett believes her microscope can shed light on the mysteries inside the bottle.

She has identified a recurring form in well-preserved old wines that might be a marker of ageability. In wine that is newly bottled and suffering from shock, the forms are broken. She also sees differences in the shapes and patterns of wines made from hillside vineyards and flat lands – sort of a microscopic view of terroir.

The problem is that Barrett, who has been photographing wine for some 20 years, has never had the resources for a systematic study to test her findings. A number of wineries have hired her to photograph their wines and she has noticed patterns based on these piecemeal looks. But she doesn't have enough data to yield scientifically substantiated results.

An example of what she'd like to do: The forms Barrett has noticed in well-preserved wines could be an indicator that the wine will last for many years – valuable information for both collectors and wine merchants. On the other hand, the shapes could simply be a substance that develops in some older wines. To know, Barrett would need to track a variety of wines over the years and see if the forms correlate to ageability. She is looking for winery partners to work with her on this and other projects.

Scientist takes a holistic approach

▶ **UNCORKED**
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Barrett studied biochemistry at the University of Illinois in the 1960s and planned to become a physician. But because women were rarely admitted to medical school, she received a Ph.D in chemistry from the University of Illinois and went into medical research.

At UCSF School of Medicine Barrett studied leukemia in children, using a microscope to identify cellular patterns indicating different stages of the disease. One day a father asked her to photograph leukemia cells to help him explain the disease to his stricken son. Soon Barrett began using her microscope to photograph other substances – vitamins, minerals, body chemicals – and presenting therapeutic slide shows for pediatric cancer patients

"The kids were bloaty, they had lost their hair, people made fun of them," she says. "The pictures showed them the beauty within."

Broadening wine's scope

Wine, art and science marry

Serendipitously, a friend introduced Barrett to Sterling Vineyards in Calistoga, which at the time had an artist-in-residence program. The first wine she photographed was a Sterling Merlot. "I didn't know anything about wine, but it was beautiful," says Barrett, who lived in Marin County at the time. "It was not like anything I'd ever seen."

Barrett became an artist in residence at Sterling in 1984 and then spent several years as a wine photographer. Despite artistic accolades and media interest (The Chronicle Sunday Magazine published the first article about her in 1984), Barrett struggled to make a living and went back to medical research in 1990.

When she returned to science, Barrett's approach had shifted from a strictly empirical one to a more holistic view of the chemistry of life. She developed a specialty in psychoneuroimmunology, or the link between peoples' emotional, physical and spiritual lives. Today she spends half of her time as a traveling lecturer, leading meditation workshops and classes about the nexus between science and spirituality.

"I know that sounds New Age-y, but I'm a serious scientist!" Barrett says, semi-apologetically.

Room with a view

While her primary focus is on teaching, Barrett never forgot her wine project and she moved from Marin to Forestville, in Sonoma County, in 2001 to be closer to the wine world. She lives up a steep hill with a vineyard view,

When she isn't teaching, Barrett is working on two books and seeking wineries to partner with on the photography project. She fantasizes about one day owning a winery of her own, and even applied recently for an assistant winemaker position. With no experience in winemaking, she didn't even land a job interview.

"They probably think I'm out of my mind," she says with a gentle laugh.

An exhibition of Barrett's "Mystic Molecules" photographs is on view at the University of Creation Spirituality in Oakland and on Barrett's Web site, *mysticmolecules.com*.

Findings suggest wine signatures change with age: an image of a 1941 Inglenook Cask Reserve Cabernet Sauvignon captured at 44 years