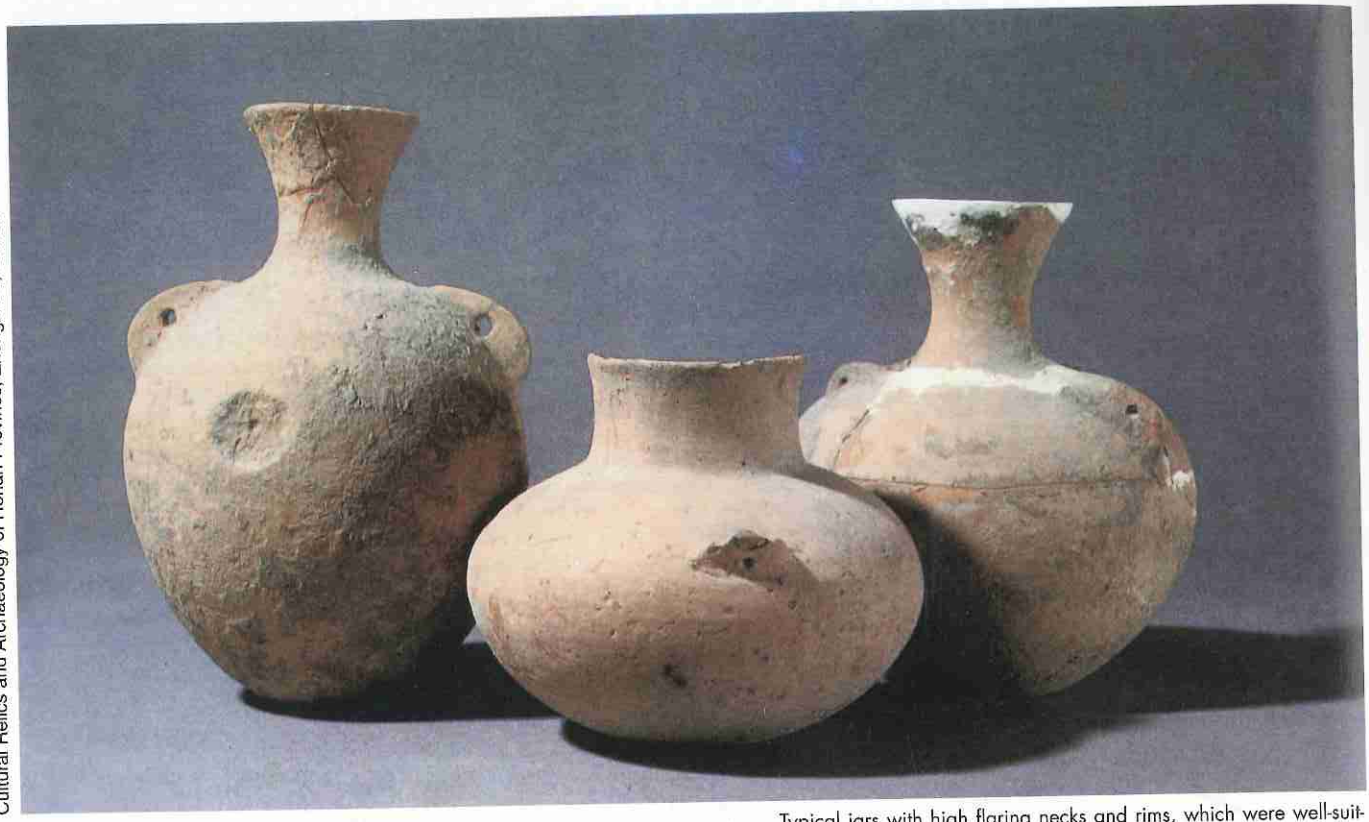


Photograph courtesy of Juzhong Zhang and Zhiqing Zhang, Institute of Cultural Relics and Archaeology of Henan Province, Zhengzhou, China.

Typical jars with high flaring necks and rims, which were well-suited for serving a fermented beverage. From Jiahu, Henan province, China, ca. 7000-6600 B.C. Dr. Patrick E. McGovern and his colleagues analyzed similar jar sherds and discovered that they contained a mixed fermented beverage of rice, honey, and fruit (hawthorn fruit and/or grape).

Wine ARCHAEOLOGIST

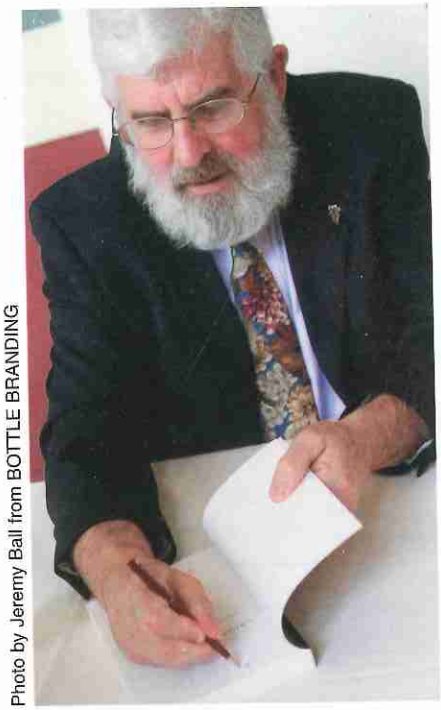
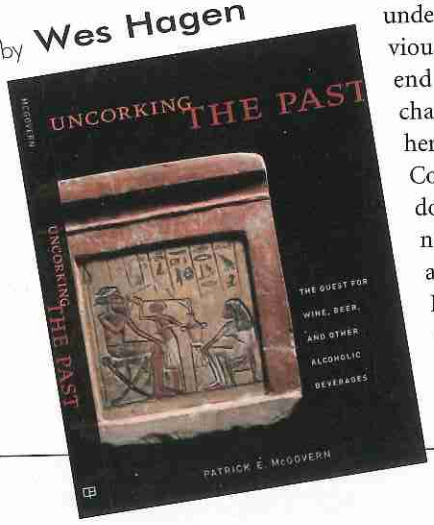


Photo by Jeremy Ball from BOTTLE BRANDING

by **Wes Hagen**



Like all great tales, the story of how I met Patrick McGovern is about leaving a state of safety for an unexpected adventure. The adventure challenges us, pushes us to understand something we had previously been ignorant to, and in the end our character is forever changed. Perhaps meeting my hero, driving him up the Central Coast of California and tasting dozens of alcoholic beverages is not as intense of a hero's journey as a survivor of D-Day's Normandy beach crawl, but it was meaningful and life-changing for me.

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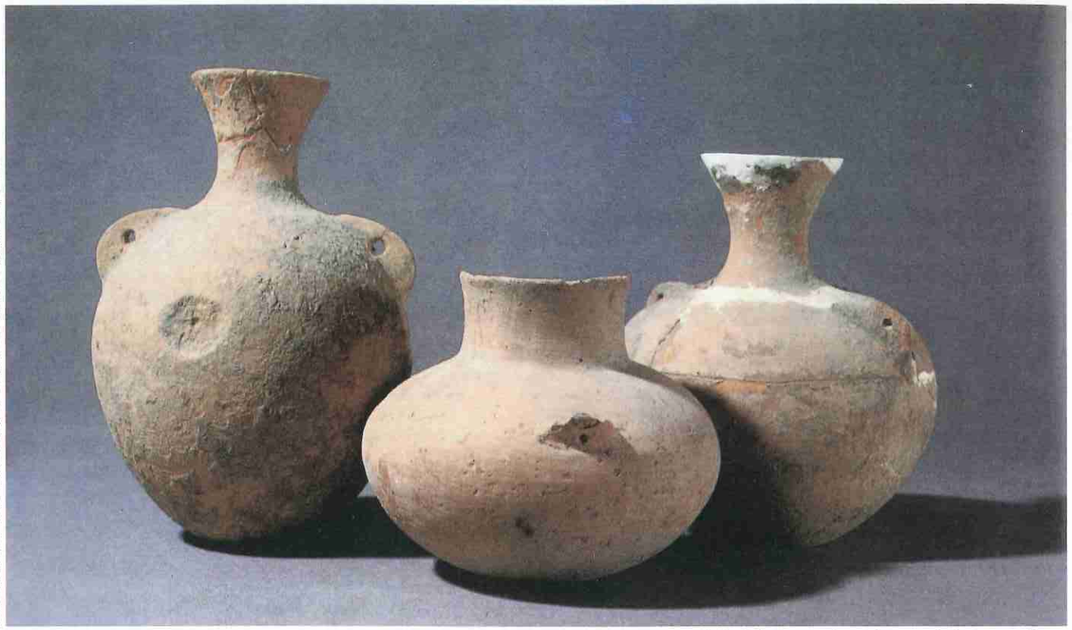

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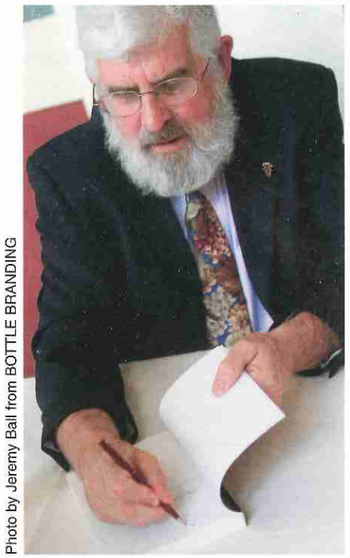

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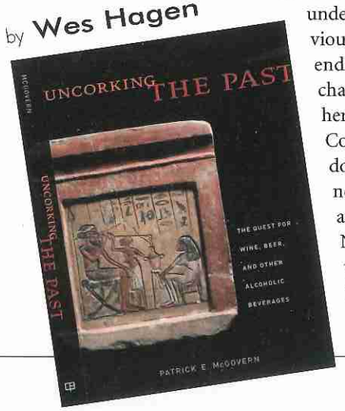

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My name is Wes Hagen, slave to the vine and herder of the yeast, and I am an unabashed fanboy of Dr. Patrick McGovern and his amazing scholarship surrounding the ancient history of fermented beverages. If you've read my articles or attended a lecture of mine, a good chunk of my presentation is borrowed respectfully from his works. If you love wine, and don't own "Ancient Wine: The Search for the Origins of Viniculture" (Princeton University Press, 2003) and "Uncorking the Past: The Quest for Wine, Beer, and Other Alcoholic Beverages" (Berkeley: University of California, 2009), you're about a century behind on the story of where grapevines, wines, beer and other beverages originated.

> "After voraciously reading the book, my view of winegrowing changed dramatically."

Dr. Bill McDonald of the University of Redlands, my alma mater, served as my intellectual inspiration throughout my undergraduate career. He taught me British Modernism, American and Russian Literature, but more importantly gave me a hunger for learning and reading that has defined and informed me throughout my adult life. He steered me to a love of comparative mythology and religious studies that persists to this day, and also delivered a fateful book to me eight years ago. That book was "Ancient Wine" by Patrick McGovern. The book captured my imagination and drove me further into my obsession with winegrowing and winemaking, which Pat defines as "viniculture." Viticulture is the science of growing all grapes (table, raisins, wine, juice), enology is the scientific/chemical study of wine and viniculture is the specific study of growing grapes for the purpose of winemaking.

After voraciously reading the book, my view of winegrowing changed dramatically. Before "Ancient Wine," I saw myself as a craftsman who had landed serendipitously in a family business of growing and making wine. It was a familial responsibility to grow grapes and make wine, and I lacked the historical perspective to put my career in the larger context of human history. As I began "Ancient Wine," it suddenly struck me: I was carrying on a human craft that had been practiced since Neolithic times, and probably much longer. Understanding where the European grapevine came from, how it moved through Europe from village to village, cross-pollinating and mutating along the way, and arrived in California by a combination of European colonization, a need for Eucharist wine, and by way of thirsty Italian and German

The author, Wes Hagen (Clos Pepe Estate), Rick Longoria (Longoria Wines), Dr. Patrick McGovern, Ken Brown (Byron and Ken Brown Wines) pose for a picture after their wine dinner. As a wine archaeologist, McGovern is sometimes referred to as The Indiana Jones of Fermented Beverages. He was in California to give a lecture at the Getty Museum.

Photo by Jeremy Ball from BOTTLE BRANDING

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McGovern discussing archaeology with dinner guests on his California trip.

biological level, and before Dr. Pat published his findings, the ancient history of wine and fermented beverages, especially physical evidence of what ancient man fermented and drank, was a hazy mystery at best. In a 1996 article published in the vaunted scientific journal *Nature*, Pat single-handedly pushed back the earliest date for human wine production by a full 2,000 years, all the way back to the Neolithic period (ca. 5400 BC). Pat's studies combined the physical sciences, archaeology, and history — an A.B. in Chemistry from Cornell University, graduate work in neurochemistry at the University of Rochester, and a Ph.D. in Near Eastern Archaeology and Literature from the Asian and Middle Eastern Studies Department of the University of Pennsylvania. It is this combination of specialties that, in my opinion, allowed Patrick to see beyond the individual academic disciplines and guided him to see

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immigrants was fascinating. I was a living part of the history of winemaking, and the more I read and studied, the more I realized that it is impossible to tell the story of Western Civilization without recognizing the influence that fermentation, specifically beer and wine, exerted on humanity. Our bodies are hard-wired to use ethanol as a source of chemical energy — a full 10% of our livers do nothing but produce an enzyme that turns fermented alcohol into usable energy. If you are religious, then God designed us to drink. If you are more secular, there is no denying alcohol's role in the evolution and development of human beings into distinctly social, artistic animals.

Dr. McGovern has pioneered the emerging field of Molecular Archaeology over the last twenty years. Pat's study of ancient fermented beverages is revolutionary enough to be analogous to Louis Pasteur's breakthroughs in fermentation science in the heart of the 19th Century. Before Pasteur we did not know how fermentation actually occurred on a micro-

the chemistry, the poetry, the physical evidence and the culture that surrounded the use of fermented beverages by humanity. As a result a new discipline was pioneered: Molecular Archaeology, and specifically, the use of molecular archaeology to study the organic residues left behind from the world's oldest deposits of alcoholic beverages.

Simply put, a great deal of Pat's time is spent traveling the world, collecting ancient residue samples of wine, beer, mead, and "extreme beverages" (mixed fermentations with added ingredients for flavor, preservation or health benefits). He takes these samples, scraped off the bottom of Neolithic to Iron Age vessels of fired pottery, funerary cups, metal containers and the like, and brings them back to his lab at the University of Pennsylvania. There he applies cutting edge laboratory technology to the samples and is usually able to reconstruct the ingredients. And while most scientists would be thrilled to discover the ingredients of the first archaeologically-confirmed alcoholic beverage on the planet (a Neolithic grog made by skilled fermenters in Jiahu, China over 9,000 years ago), Dr. Pat had a brilliant idea on how to take his amazing findings to a new, broader audience. As I learned when I met the man, Dr. Pat isn't only a scientist, he is also a lover of the beverages he studies. So when Pat discovered the ingredients of the rice/honey/grape/hawthorn-fruit recipe of ancient Jiahu, he considered the work unfinished until he could taste what the Chinese were drinking so many millennia ago. The same was true of the beverage residue he collected and studied from the funerary cache that is attributed to, and generally confirmed as being, King Midas. What did they drink at King Midas' funeral? What seems like a fantastic question became reality. He not only discovered the recipe, but he had the Delaware-based Dogfish Head Brewery begin the experimentation and fermentation to recreate these historic drinks for the public to taste. Scientist, historian, archaeologist, lab-geek, drinker. Brilliant.

At the beginning of Summer 2011, I received word from one of my customers and friends that Dr. Pat was coming to Los Angeles to give a series of lectures at the Getty Villa near Santa Monica. I got a crazy idea. I scoured the internet and the University of Pennsylvania website until I found Dr. Pat's email address and without introduction, I sent him an invitation. I was a fan of his writing, a devotee of his research, and I would be honored to pick him up at LAX, drive him to Santa Barbara Wine Country, host him as an honored guest at a dinner with the "intelligentsia" of the Santa Barbara Wine Country, and then deliver him back to Los Angeles for his lecture the next day. We'd taste lots of wines in between, and it would be a lovely way to spend a day or two in California. Nothing ventured, nothing gained, I thought.

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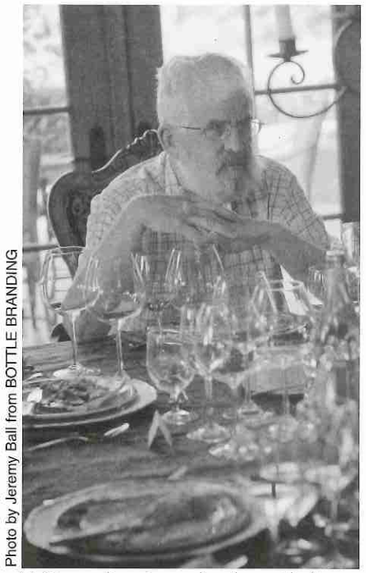
His response came much faster than I had expected, an echo of the fact that academia and academics can now connect via computers in a manner similar to the way information traveled by way of European coffee shops in the Age of



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Molecular Archaeology

You probably know that molecules are combinations of atoms, bonded together. For example, a molecule of water contains two hydrogen atoms and one oxygen atom, hence the chemical shorthand H_2O. You probably also know that archaeology is the study of human history. However, you may still wonder what it means when those two words get put together. The answer is that molecular archaeology is the study of human history using chemistry — or sometimes molecular biology — as a tool.

For example, let's say that you have a shard of ancient pottery and you're wondering if the residue on it was from wine. How would you test for that? Wine is mostly water, but the presence of water could mean that most any beverage has been in the vessel (or it was stored somewhere humid). Alcohol is prevalent in wine, but it is very volatile and not specific to wine. (Fruit juice could have been stored in the vessel and gone bad.) When testing putative wine vessels, McGovern and his lab look for tartaric acid — an acid prevalent in grapes, but not found (in any significant quantities) in most other fruits. The presence of tartaric acid on the inside surface of a vessel suggests that it once held wine.

But how do you test for tartaric acid? In instrumental chemistry, there are many methods of analyzing small amounts of material to determine their composition. In the case of wine archaeology, McGovern's lab uses infrared spectroscopy. In infrared spectroscopy, researchers shine infrared light (light with longer wavelengths than that in the visible spectrum) at different wavelengths through a sample. Sensors detect which frequencies of light the sample absorbs and which frequencies of light pass through the sample. This pattern is compared to a sample known to be pure tartaric acid.

Of course, it is always possible that the tartaric acid is the result of chemical reactions that occured long after the vessel had been dry and buried. (Perhaps succinic acid was present and reacted to form tartaric.) As such, the results need to be interpreted in light of what else is known about the vessel and culture it came from.

-- Chris Colby

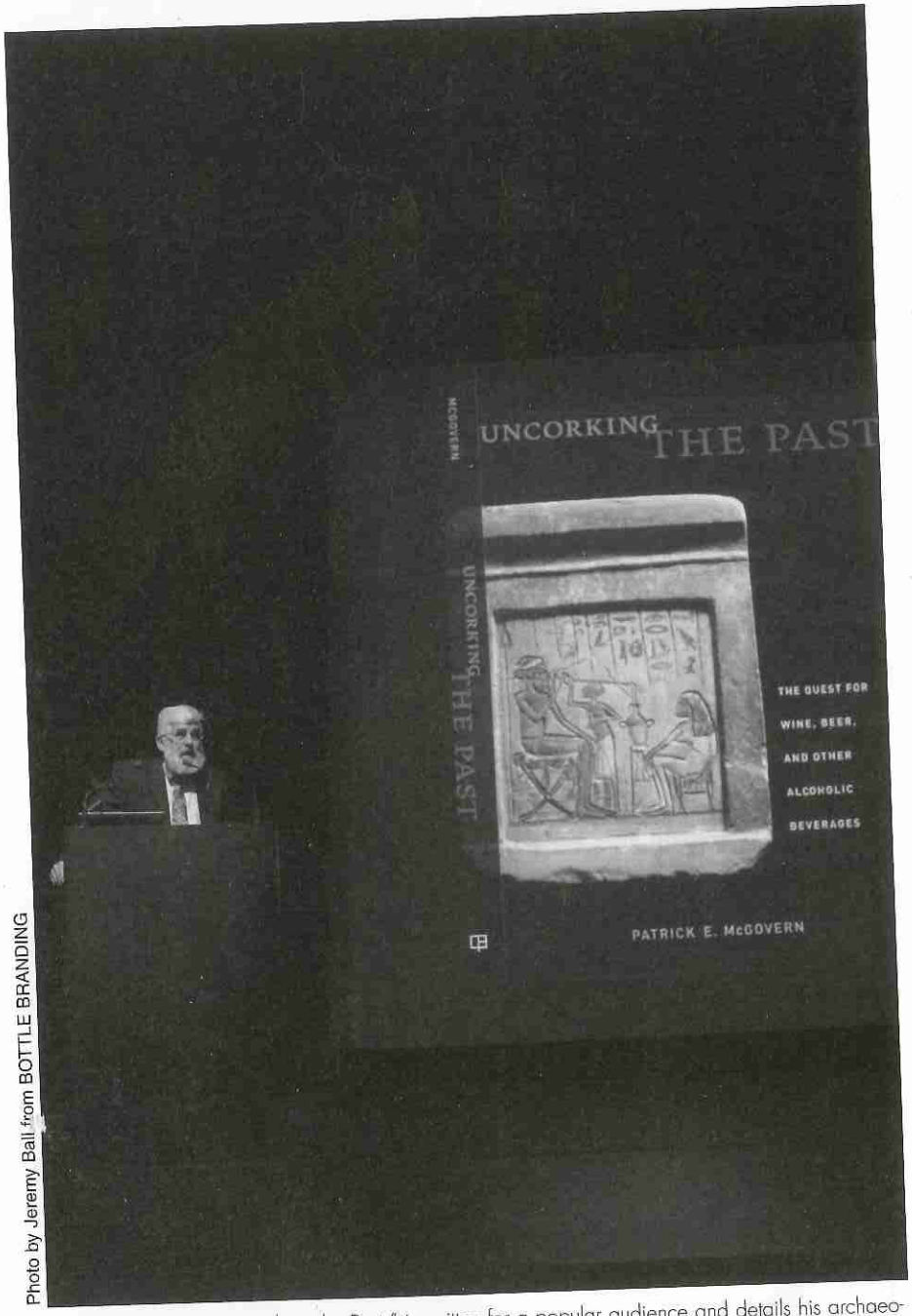

Photo by Jeremy Ball from BOTTLE BRANDING

McGovern's book, "Uncorking the Past," is written for a popular audience and details his archaeological studies of the drinking habits of previous cultures.

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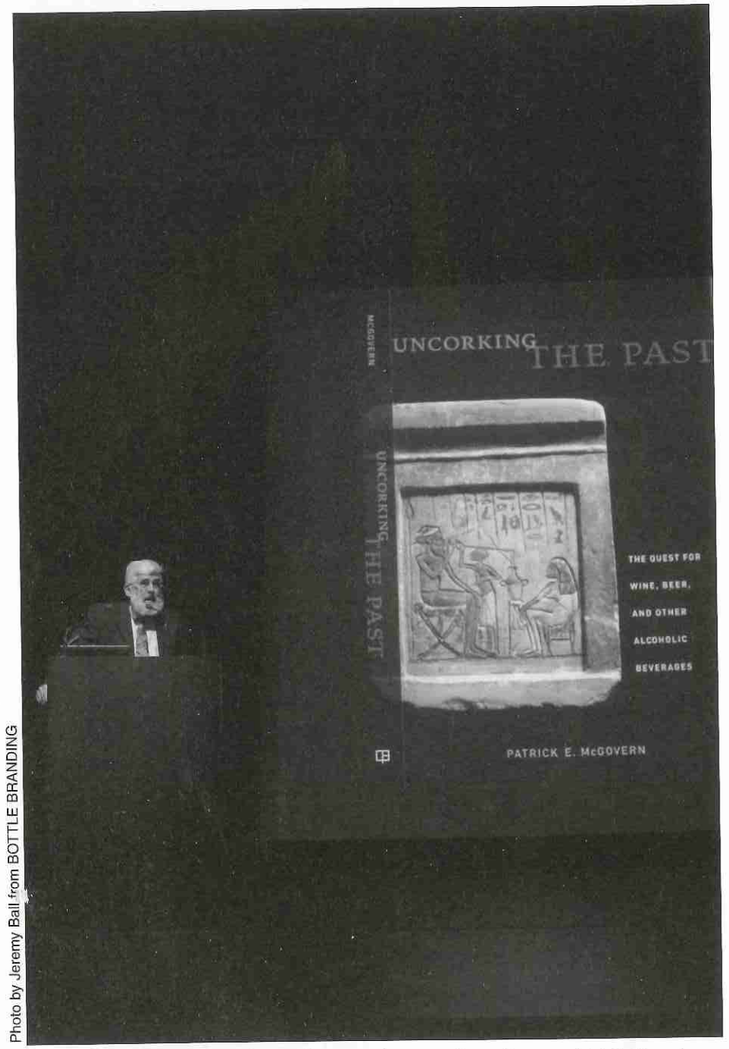
Enlightenment, only 1,000 times more efficiently. I suspect that Dr. Pat Googled me, decided I wasn't specifically dangerous and was actually a winemaker, and requested a possible itinerary. A few weeks later I was at his gate at LAX, holding up my iPad screen that read "McGovern," but it wasn't needed when I saw the classic bearded professor descending from the escalator. We met, shook hands, dispensed with pleasantries, and jumped into the vineyard truck and pointed it north up Highway 101. Lunch at Brophy Brothers, a touristy seafood restaurant with unbelievable views of Santa Barbara and the Pacific, was aided by perfect, sunny weather and a few Anchor Steam beers — arguably the first "microbrew" in the United States. We ate oysters, clams, shrimp, mussels and sipped beer, and I took out my notes and continued to ask for clarification on some finer points of ancient viticulture. Was the first hermaphroditic vine found or selected from a domesticated vineyard? (He thought it was found.) What did the first trellis look like, and when was the vine taken out of the trees and into the villages? The shellfish disappeared as quickly as the beer, and we finished our trip into the Santa Ynez Valley by stopping to taste wine with Chris Burroughs (of "Sideways" movie fame) at the Alma Rosa tasting room near Buellton.

We avoided the inclination to behave badly like the Sideways stars, had some lovely conversations with patrons and Chris, and returned to Clos Pepe to allow Pat to get a good post-flight nap before the main event: a symposium-like dinner where we would share Dr. McGovern with the local winemaking community.

In attendance were two of the three Master Winemakers in Santa Barbara: Ken Brown (who started Byron Winery in Santa Maria) and Rick Longoria (winemaker for Carey, Gainey, Rideau, and Longoria Wines, and also a student of Andre Tchelistcheff, who is the considered the Grandfather of California Cabernet Sauvignon). Young winemakers, collectors, bon vivants and an important Chinese pottery collector were also invited, and we asked Pat to switch seats a few times during the four courses so he could spend time and chat with all the guests. Each attendee brought the oldest bottle of Santa Barbara County wine they could find, and we provided context with Bordeaux, Burgundy, Barolo, Rhone wines from the 1970s through the 1990s. After a great dinner and superb conversation, we retired to the night air and did a tasting of vintage Port, local grappas and marc, which led to a discussion (and of course a tasting) of some fine single malt Scotch. From my best recollection, we tried almost 20 different adult beverages throughout the evening, and even though



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After allowing for a long summer slumber, I finished my vineyard work the next morning and loaded Pat in the truck for the trip back to Santa Monica. Besides a few more wines we tasted on the way, my intention was to share one of my favorite restaurants in the world with Pat, and then drive him from Oxnard to Malibu to Pacific Palisades along the famous Pacific Coast Highway. We had a beautiful, sunny day once again, and I'm sure Pat was wondering what I was subjecting him to when we parked in front of La Super Rica in Santa Barbara for lunch. This is a taco-shack-walk-up counter and a glorified tent with tables, but even at 11:30 the line was ten people out the door. I insisted on ordering and we shared five items including the incomparable Chile Relleno, the pasilla-pepper Rajas, fresh tortillas and tacos with various meats. A few Negro Modelos exorcized the last bits of haze from the night before, and we continued to discuss aspects of ancient wine and viticulture in the Caucasus region as we left Santa Barbara for the coastal jaunt to his waiting hotel.

I love California the way that Pat loves the study of ancient wine, and I was honored to share the two days with him as handler/tour guide/bartender. I have written this article to introduce Pat's work to you in the most general way possible, and I hope that a glimpse into my meaningful time with the Professor will encourage you to pick up Pat's book either on Kindle or in print and enjoy an amazing trip through the history of man's relationship with fermentation.

His lectures at The J. Paul Getty Museum were sold out and standing-room only, and my good friend and inspiration for reading Pat's books, Dr. Bill McDonald, was (miraculously) parked behind me in the lecture hall. The Getty Villa also houses an amazing array of ancient pottery, Egyptian, Roman and Greek wine drinking vessels, so my friends and I spent an entire day wandering the Getty's collections and then were treated to a spirited (pun intended) lecture that followed the history of booze; from the conjectured first use of alcohol by *Homo sapiens* perhaps 100,000 years ago or more, to the archaeologically confirmed record of beverages being made in the last 10,000. One of the greatest moments is when Pat played a video of different species of mammals seeking out fermented fruits, eating them, and stumbling around the jungle. All mammals have sensory organs that lead them to fermented fruits, he revealed, and most seem to thoroughly enjoy intoxication. And who are we to argue with nature?

On cue, at the end of the lecture, we were invited into the gorgeous Pompeii-inspired gardens of the Getty, as the fog rolled off the Pacific, to taste Dogfish Head's recreations of the 9,000 year old Jiahu beverage (Chateau Jiahu), the funerary beer of King Midas (Midas Touch) and a chocolate-based libation called Theobroma, based on residue found from a Honduran vessel from 1400 BC. A lecture is great, but the flavors brought the past into my mouth, into my head, and offered the euphoric capstone on an experience I will never forget. Thanks for visiting, Pat! Come back soon and bring more of that historic hooch!

Books by McGovern

"Uncorking the Past: The Quest for Wine, Beer, and Other Alcoholic Beverages" is written with a highly-satisfying level of narrative storytelling, perhaps a more casual read than "Ancient Wine," but still filled with an amazing level of scholarship and mind-blowing theories of how alcohol helped humans develop culture, art, music.

"Ancient Wine: the Search for the Origins of Viniculture" is a more scholarly and intensive study of where wine came from and how people moved it around the planet. WM

Wes Hagen is the winemaker at Clos Pepe vineyards and Backyard Vines columnist for WineMaker *magazine. A collection of his columns are available as a special issue "The WineMaker Guide to Growing Grapes," at www.winemakermag.com/store. Read his blogs on the Web at www.winemakermag.com/stories/grapes.*