Wine at the Dawn of Civilization

By Lee R. Berger

Hieroglyphics on papyrus record that in the year 1300 B.C. the pharaoh Seti I laid a charge against a man for being too drunk on beer. While this may be the first written record of overindulgence, the origins of beer, wine and other fermented beverages go back a lot further, beyond the written record of humankind. In fact, the fermentation of fruits and malts into alcohol coincide with the very origins of complex civilization, around seven to eight thousand years ago. It's quite possible that wine played a major role in the merging of social, religious, economic and political institutions into permanent centers that we use to define modern civilization.

Over the last several years, the dates for the first evidence of deliberate fermentation have been pushed further and further back. Only ten years ago, based on the first evidence, it was thought that deliberate fermentation to produce alcoholic beverages first took place just over 5000 years ago. But in 1996 an archeological team from the University of Pennsylvania excavated six jars at the site of Hajji Ferez Tepe in what is now Iran; the jars contained calcium salts from tartaric acid, which naturally occurs in large quantities only in grapes, as well as resins from a local tree that were probably used as a preservative. The scientists concluded that this was not just a case of accidentally fermented grape juice, but deliberate wine making. They estimated that the site was 7,000 years old—a remarkable 2000 years earlier than the previous, oldest evidence of fermentation. The number also corresponds with the dating of some of the earliest evidence of complex civilizations anywhere on earth.

But humanity's first use of fermented fruit beverages was probably not as deliberate and methodical as what is suggested by the jars found at Hajji Ferez Tepe. Early man's first exposure to this process may go back much further in time to the point where, in tropical areas, humans and their ancestors had access to naturally fermenting fruits.

Fermentation is, of course, the process that produces certain alcoholic beverages like wine and beer. In general terms, fermentation is the breaking down of complex organic substances into simple organic substances. During the process, waste products are produced. The waste product most important for the production of consumable alcoholic beverages is ethyl alcohol. Fermentation to produce ethyl alcohol requires the presence of yeasts. For barley and other grains to ferment, yeasts must be introduced. In early societies, men and women may have accomplished this by adding human saliva, a good source of natural yeasts, to the mash by chewing grains and then spitting them into a container to ferment. Grapes and many other fruits, however, have yeasts naturally growing on their skins, so that with no additives and thus no deliberate input by humans, grape juice will turn into wine if just left to sit. This natural advantage over grains makes it likely that fruit-based beverages like wine were the first intoxicating beverages to be used by humans.

In Africa, where I conduct my explorations into human origins, many fruiting trees have natural yeasts present. Under certain conditions, these fruits ferment when they fall to the ground. One such tree, the marula, is legendary as a source of naturally occurring fermented alcohol. The legend, unfortunately, stems from filmed demonstrations made many years ago of cavorting monkeys and staggering elephants dining on fermented marula fruits; these were thought to be staged, but more recent studies have confirmed that many animals in Africa deliberately seek out fermented fruits in order to become intoxicated, and primates are among the most frequent elbow-benders.

It is an established fact that almost every critical event related to human origins took place in Africa—our evolution from four-legged to two-legged creatures, the development of our relatively large brain, even the delicate physical features of our species which so differentiates us from our distant, more robust ancestors. For millions of years members of our family tree evolved in Africa, utilizing first a gathering lifestyle, when they were little more than bipedal apes, and then, as more complex tools emerged and physical morphologies changed, a hunter-gatherer lifestyle. Our culture itself is a product of the African environment. Stone tools were first invented here more than 2.5 million years ago. The earliest evidence of the controlled use of fire, almost 1.5 million years ago, is found on this continent. Research now tells us that early attempts at figurative art—even indications of our very spirituality, in the form of burial of the dead—also originated in Africa at or near the point of our genetic emergence as a species some 125,000 years ago.

It was this combination of physical, cultural and behavioral change that allowed the first members of our genus to emerge from Africa almost a million and a half years ago, riding wave upon wave of innovations that would result in migrations of new forms of bipedal ape—one of which, *Homo sapiens sapiens*, would emerge as recently as fifty to sixty thousand years ago to quickly dominate the globe. This African *Homo sapiens* was a well-adapted creature. With human language, human spirituality and the ability to mold many aspects of their environment through the use of complex tools, modern humans migrated out of Africa to conquer first the Old World and then, just over 15,000 years ago, the New World.

But why aren't we still hunting and gathering our way around the world? It was, as evidenced by our sheer distribution around the planet, a very successful way of life. It was low stress, and food was easy to acquire. What changed in human history that made us the way we are today, organized into what is commonly referred to as civilized society, where social, religious, economic and political institutions are merged in permanent centers—in effect, cities?

About eight to ten thousand years ago a radical shift began to take place in human behavior. It is evidenced in the way many people around the globe changed the way they acquired the necessities of life. We see at this time in the archaeological record the first domestication of animals and plants. We also see a persistent inclination to settle near coastal areas (see sidebar). In certain parts of the world this corresponds with the development of a more sedentary lifestyle. In other words, with agriculture came the necessity to protect one's crops. The earliest evidence of these types of "modern" civilizations are found in Mesopotamia's Fertile Crescent, which encompasses parts of what are today known as Lebanon, Israel, Syria, Turkey, Iraq

and Iran. The wine-making evidence at Hajji Ferez Tepe, while not dated at the earliest origin of agriculture in the region, is fairly close. But archaeological evidence for behavior almost always post-dates the origin of that behavior, so it won't be surprising to any of us if in years to come excavations in this, or other areas, reveal even earlier evidence of wine making. True city-states only appear some two-thousand years after the wine making of Hajji Ferez Tepe, and by this time, evidence for the making of wine and beer is widespread.

So was the origin of civilization bound to the fermentation of grapes and the making of wine? Certainly the timing is right, and as I mentioned, humans and our ancestors have probably been seeking out ways of accessing fermented fruits for their intoxicating effects in Africa for tens of thousands, if not millions, of years. It really is not too much of a scientific leap of faith to suggest that once humans had conducted these early chemistry experiments and could control the process of fermentation, that it, along with complex changes in social organization, may have provided a critical stimulus to the development of the first permanent settlements, and then to extensive trade routes to allow the effective sharing of the product of the grape.

But please don't simply take the possibility of the civilizing effects of alcohol on the human species as an excuse to completely over-indulge. The more one drinks the more one is civilized? Hardly. Spare a thought for the man charged by the Pharaoh Seti I for being drunk on too much beer. Imagine the implication of being charged for over-indulgence by a living god!

Box

Who Ate the First Oyster?

It is rare that a paleo-anthropologist is qualified to answer a dinner-party riddle, but this one happens to be in my ballpark. And the answer is very much tied to the explosion of neural, cultural and physical development that occurred in our ancestors many thousands of years ago.

As a species, we are dependent on the oceans. Even today more than fifty percent of all people living in the United States live in coastal areas, and worldwide some 39 percent of all humans live within 100 kilometers of a coast. There are obvious practical and aesthetic reasons for this, but there is an element of this dependence that refers to our very nature as human beings.

Fossil evidence indicates that leading contenders for oldest oyster eaters lived at the extremes of the African continent. In 2000, scientists studying deposits in Eritrea in northern Africa discovered hand axes and obsidian flakes embedded in reef deposits where oysters, clams and crabs were found, indicating the probability that the makers of the tools were utilizing the marine environment approximately 125,000 years ago. Yet hand axes are not typically associated with such a recent date; they were in far more common use by the Acheulean culture, which went extinct around 250,000 years ago in Africa. In my opinion, stronger evidence for early oyster eating was

found closer to (my) home, in the Cape of South Africa. At Klasies River Cave, buried in shell middens (mounds of shells and sand and other refuse built up over hundreds of thousands of years), there is definitive evidence of anatomically modern humans subsisting on a wide variety of coastal marine foods, largely limpets and abalone but also oysters. This shelter is dated to around 115,000 years ago.

These early humans somehow found access to this remarkably rich resource that had almost no land-based competitors. It is probable that this change in behavior and habitat almost single-handedly ensured the success of the human species.

Why is the success of the human species tied to the oceans? Well, as your mother always told you, eating seafood is good for you. Iodine, zinc, copper, iron and critical long-chain polyunsaturated fats are all "brain-foods." Their provision in the developmental stages of the human brain is critical. They are all, of course, found in abundance in marine foods but in much lower quantities in terrestrial sources such as eggs, animal fat and meat. So seafood perhaps assisted the evolution of our modern human brain.

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