ADULT BEVERAGES

ALCOHOL IN THE WESTERN WORLD

The role of alcohol in Western civilization has changed dramatically during this millennium. Our current medical interpretation of alcohol as primarily an agent of disease comes after a more complex historical relationship

By Bert L. Vallee

A SUBSTANCE, LIKE A PERSON, MAY HAVE DISTINCT AND EVEN contradictory aspects to its personality. Today ethyl alcohol, the drinkable species of alcohol, is a multifaceted entity; it may be social lubricant, sophisticated dining companion, cardiovascular health benefactor or agent of destruction. Throughout most of Western civilization's history, however, alcohol had a far different role. For most of the past 10 millennia, alcoholic beverages may have been the most popular and common daily drinks, indispensable sources of fluids and calories. In a world of contaminated and dangerous water supplies, alcohol truly earned the title granted it in the Middle Ages: *aqua vitae,* the "water of life."

Western civilization has wine and beer to thank for nourishment and hydration during most of the past 10,000 years. Before the very recent availability of clean, pure water, alcoholic beverages may have been the only safe liquids to drink.

Illustrations by Bryan Chrystie

Potent evidence opens a window into a societal relationship with alcohol that is simply unimaginable today. Consider this statement, issued in 1777 by Prussia's Frederick the Great, whose economic strategy was threatened by importation of coffee: "It is disgusting to notice the increase in the quantity of coffee used by my subjects, and the amount of money that goes out of the country as a consequence. Everybody is using coffee; this must be prevented. His Majesty was brought up on beer, and so were both his ancestors and officers. Many battles have been fought and won by soldiers nourished on beer, and the King does not believe that coffee-drinking soldiers can be relied upon to endure hardships in case of another war."

Surely a modern leader who urged alcohol consumption over coffee, especially by the military, would have his or her mental competence questioned. But only an eyeblink ago in historical time, a powerful head of government could describe beer in terms that make it sound like mother's milk. And indeed, that nurturing role may be the one alcohol played from the infancy of the West to the advent of safe water supplies for the masses only within the past century.

Natural processes have no doubt produced foodstuffs containing alcohol for millions of years. Yeast, in metabolizing sugar to obtain energy, creates ethyl alcohol as a by-product of its efforts. Occasionally animals accidentally consume alcohol that came into being as fruit "spoiled" in the natural process of fermentation; inebriated birds and mammals have been reported. Humans have a gene for the enzyme alcohol dehydrogenase; the presence of this gene at least forces the conjecture that over evolutionary time animals have encountered alcohol enough to have evolved a way to metabolize it. Ingestion of alcohol, however, was unintentional or haphazard for humans until some 10,000 years ago.

About that time, some Late Stone Age gourmand probably tasted the contents of a jar of honey that had been left unattended longer than usual. Natural fermentation had been given the opportunity to occur, and the taster, finding the effects of mild alcohol ingestion provocative, probably replicated the natural experiment. Comrades and students of this first oenologist then codified the method for creating such mead or wines from honey, dates or sap. The technique was fairly simple: leave the sweet substance alone to ferment.

UNTOLD MASSES OF OUR PROGENITORS DIED FROM QUENCHING THEIR THIRST WITH WATER. THE PILGRIMS LANDED AT PLYMOUTH ROCK ONLY BECAUSE THEIR BEER STORES HAD RUN OUT.

Beer, which relies on large amounts of starchy grain, would wait until the origin and development of agriculture. The fertile river deltas of Egypt and Mesopotamia produced huge crops of wheat and barley; the diets of peasants, laborers and soldiers of these ancient civilizations were cereal-based. It might be viewed as a historical inevitability that fermented grain would be discovered. As in the instance of wine, natural experiments probably produced alcoholic substances that aroused the interest of those who sampled the results. Before the third millennium B.C., Egyptians and Babylonians were drinking beers made from barley and wheat.

Wine, too, would get a boost from agriculture. Most fruit juice, even wild grape juice, is naturally too low in sugar to produce wine, but the selection for sweeter grapes leading to the domestication of particular grape stock eventually led to viniculture. The practice of growing grape strains suitable for wine production has been credited to people living in what is now Armenia, at about 6000 B.C., although such dating is educated guesswork at best.

The creation of agriculture led to food surpluses, which in turn led to ever larger groups of people living in close quarters, in villages or cities. These municipalities faced a problem that still vexes, namely how to provide inhabitants with enough clean, pure water to sustain their constant need for physiological hydration. The solution, until the 19th century, was nonexistent. The water supply of any group of people rapidly became polluted with their waste products and thereby dangerous, even fatal, to drink. How many of our progenitors died attempting to quench their thirst with water can never be known. Based on current worldwide crises of dysentery and infectious disease wrought by unclean water supplies, a safe bet is that a remarkably large portion of our ancestry succumbed to tainted water.

In addition, the lack of liquids safe for human consumption played a part in preventing long-range ocean voyages until relatively recently. Christopher Columbus made his voyage with wine on board, and the Pilgrims landed at Plymouth Rock only because their beer stores had run out. An early order of business was luring brewmasters to the colonies.

ALCOHOL VS. WATER

NEGATIVE EVIDENCE arguing against a widespread use of water for drinking can be found in perusal of the Bible and ancient Greek texts. Both the Old and New Testaments are virtually devoid of references to water as a common human beverage. Likewise, Greek writings make scant reference to water drinking, with the notable exception of positive statements regarding the quality of water from mountain springs. Hippocrates specifically

IN BRIEF

Water was unsafe to drink for most of human history. Evidence from archaeology and ancient literature suggests that for millennia, primitive, low-alcohol beers and wine were the preferred beverages—and common medicines—in regions where people had the genetic ability to metabolize alcohol. All through Western history, the normal state of mind may have been one of inebriation.

Religious authorities endorsed and even produced beer and wine for centuries. But the development of stronger distilled spirits by Islamic Arab alchemists eventually led to growing abuse and health impacts that remain widespread today.

To combat alcohol dependence, some have championed temperance, whereas others have searched for medical cures.

cited water from springs and deep wells as safe, as was rainwater collected in cisterns. The ancients, through what must have been tragic experience, clearly understood that most of their water supply was unfit for human consumption.

In this context of contaminated water supply, ethyl alcohol may indeed have been mother's milk to a nascent Western civilization. Beer and wine were free of pathogens. And the antiseptic power of alcohol, as well as the natural acidity of wine and beer, killed many pathogens when the alcoholic drinks were diluted with the sullied water supply. Dating from the taming and conscious application of the fermentation process, people of all ages in the West have therefore consumed beer and wine, not water, as their major daily thirst quenchers.

Babylonian clay tablets more than 6,000 years old give beer recipes, complete with illustrations. The Greek *akratidzomai,* which came to mean "to breakfast," literally translates as "to drink undiluted wine." Breakfast apparently could include wine as a bread dip, and "bread and beer" connoted basic necessity much as does today's expression "bread and butter."

The experience in the East differed greatly. For at least the past 2,000 years, the practice of boiling water, usually for tea, has created a potable supply of nonalcoholic beverages. In addition, genetics played an important role in making Asia avoid alcohol: approximately half of all Asian people lack an enzyme necessary for complete alcohol metabolism, making the experience of drinking quite unpleasant. Thus, beer and wine took their place as staples only in Western societies and remained there until the end of the 19th century.

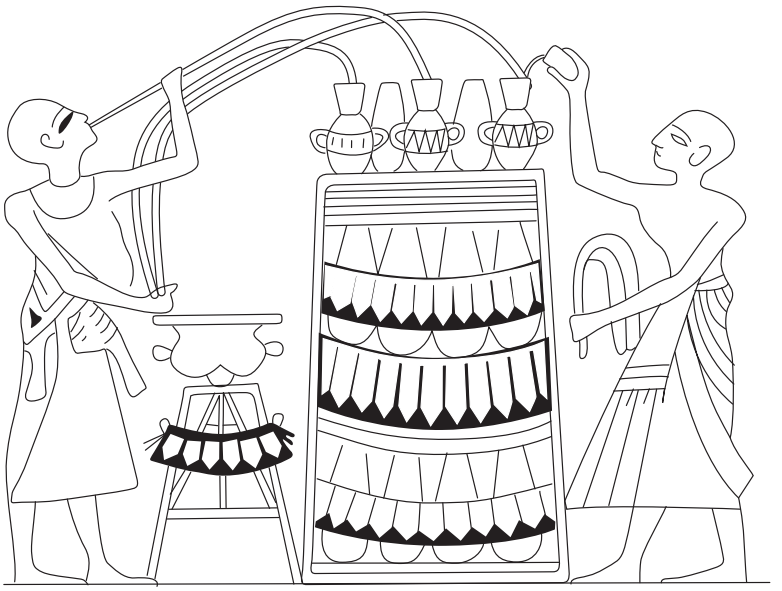
The traditional production of beer and wine by fermentation of cereals and grapes or other fruits produced beverages with low alcohol content compared with those familiar to present-day consumers. The beverages also contained large amounts of acetic acid and other organic acids created during fermentation. Most wines of ancient times probably would turn a modern oenophile's nose; those old-style wines in new bottles would more closely resemble today's vinegar, with some hints of cider, than a prizewinning merlot.

Because the alcohol content of daily staple drinks was low, consumers focused on issues of taste, thirst quenching, hunger satisfaction and storage rather than on intoxication. Nevertheless, the "side effects" of this constant, low-level intake must have been almost universal. Indeed, throughout Western history the normal state of mind may have been one of inebriation.

The caloric value of nonperishable alcoholic beverages may also have had a significant part in meeting the daily energy requirements of societies that might have faced food shortages. In addition, they provided essential micronutrients, such as vitamins and minerals.

Alcohol also served to distract from the fatigue and numbing boredom of daily life in most cultures, while alleviating pain for which remedies were nonexistent. Today people have a plethora of handy choices against common aches and pain. But until the 20th century, the only analgesic generally available in the West was alcohol. From the Book of Proverbs comes this prescription: "Give strong drink unto him that is ready to perish, and wine unto them that be of heavy hearts. Let him drink, and forget his poverty, and remember his misery no more." A Sumerian cuneiform tablet of a pharmacopoeia dated to about 2100 B.C. is generally cited as the oldest preserved record of medicinal alcohol, although Egyptian papyri may have preceded the tablet. Hippocrates' therapeutic system featured wines as remedies for almost all acute or chronic ailments known in his time, and the Alexandrian School of Medicine supported the medical use of alcohol.

ANCIENT WINE



Egyptian paintings show alcohol as integral to the lives of the nobility. This depiction of wines being blended is from Amanemhat's Tomb, circa 1400 B.C.

RELIGION AND MODERATION

THE BEVERAGES of ancient societies may have been far lower in alcohol than their current versions, but people of the time were aware of the potentially deleterious behavioral effects of drinking. The call for temperance began quite early in Hebrew, Greek and Roman cultures and was reiterated throughout history. The Old Testament frequently disapproves of drunkenness, and the prophet Ezra and his successors integrated wine into everyday Hebrew ritual, perhaps partly to moderate undisciplined drinking, thus creating a religiously inspired and controlled form of prohibition.

In the New Testament, Jesus obviously sanctioned alcohol consumption, resorting to miracle in the transformation of water to wine, an act that may acknowledge the goodness of alcohol versus the polluted nature of water. His followers concentrated on extending measures to balance the use and abuse of wine but never supported total prohibition. Saint

SOURCE: *FOOD: THE GIFT OF OSIRIS,* VOL 2, ACADEMIC PRESS, 1977

Paul and other fathers of early Christianity carried on such moderating attitudes. Rather than castigating wine for its effects on sobriety, they considered it a gift from God, both for its medicinal qualities and for the tranquilizing characteristics that offered relief from pain and the anxiety of daily life.

Traditionally, beer had been the drink of the common folk, whereas wine was reserved for the more affluent. Grape wine, however, became available to the average Roman after a century of vineyard expansion that ended in about 30 B.C., a boom driven by greater profits for wine grapes compared with grain. Ultimately, the increased supply drove prices down, and the common Roman could partake in wine that was virtually free. Roman viniculture declined with the empire and was inherited by the Catholic Church and its monasteries, the only institutions with sufficient resources to maintain production.

For nearly 1,300 years the Church operated the biggest and best vineyards, to considerable profit. Throughout the Middle Ages, grain remained the basic food of peasants and beer their normal beverage, along with mead and homemade wines or ciders. The few critics of alcohol consumption were stymied by the continuing simple fact of the lack of safe alternatives. Hence, despite transitions in political systems, religions and ways of life, the West's use of and opinion toward beer and wine remained remarkably unchanged. But a technological development would alter the relationship between alcohol and humanity.

After perhaps 9,000 years of experience drinking relatively low alcohol mead, beer and wine, the West was faced with alcohol in a highly concentrated form, thanks to distillation. Developed in about A.D. 700 by Arab alchemists (for whom *al kohl* signified any material's basic essence), distillation brought about the first significant change in the mode and magnitude of human alcohol consumption since the beginning of Western civilization. Although yeasts produce alcohol, they can tolerate concentrations of only about 16 percent. Fermented beverages therefore had a natural maximum proof. Distillation circumvents nature's limit by taking advantage of alcohol's 78 degree Celsius (172 degree Fahrenheit) boiling point, compared with 100 degrees C for water. Boiling a water-alcohol mixture puts more of the mix's volatile alcohol than its water in the vapor. Condensing that vapor yields liquid with a much higher alcohol level than that of the starting liquid.

The Arab method—the custom of abstinence had not yet been adopted by Islam—spread to Europe, and distillation of wine to produce spirits commenced on the continent in about A.D. 1100. The venue was the medical school at Salerno, Italy, an important center for the transfer of medical and chemical theory and methods from Asia Minor to the West. Joining the traditional alcoholic drinks of beer and wine, which had low alcohol concentration and positive nutritional benefit, were beverages with sufficient alcohol levels to cause the far-reaching problems still with us today. The era of distilled spirits had begun.

Knowledge of distillation gradually spread from Italy to northern Europe; Alsatian physician Hieronymus Brunschwig described the process in 1500 in *Liber de arte distillandi de compositis,* the first printed book on distillation. By the time Brunschwig was a best-selling author, distilled alcohol had earned its split personality as nourishing food, beneficent medicine and harmful drug. The widespread drinking of spirits followed closely on the heels of the 14th century's bouts with plague, notably the Black Death of 1347–1351. Though completely ineffective as a cure for plague, alcohol did make the victim who drank it at least feel more robust. No other known agent could accomplish even that much. The medieval physician's optimism related to spirits may be attributed to this ability to alleviate pain and enhance mood, effects that must have seemed quite remarkable during a crisis that saw perhaps two thirds of Europe's population culled in a single generation.

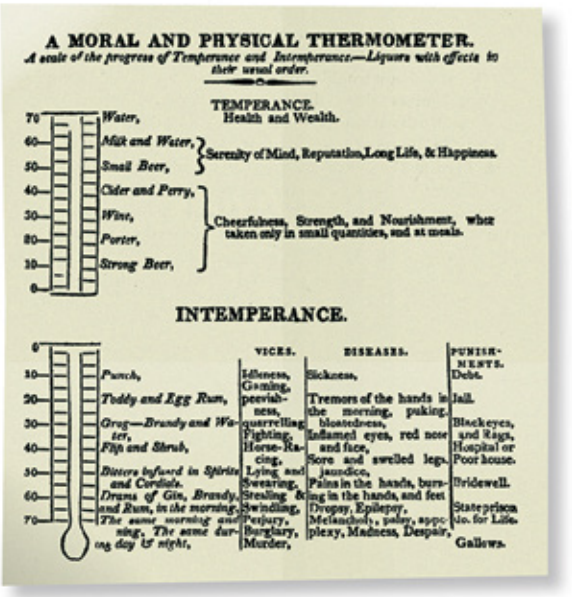
Economic recovery following the subsidence of the plague throughout Europe generated new standards of luxury and increased urbanization. This age witnessed unprecedented ostentation, gluttony, self-indulgence and inebriation. Europe, apparently relieved to have survived the pestilence of the 14th century, went on what might be described as a continentwide bender. Despite the obvious negative effects of drunkenness and despite attempts by authorities to curtail drinking, the practice continued until the beginning of the 17th century, when nonalcoholic beverages made with boiled water became popular. Coffee, tea and cocoa thus began to break alcohol's monopoly on safety.

In the 18th century a growing religious antagonism toward alcohol, fueled largely by Quakers and Methodists and mostly in Great Britain, still lacked real effect or popular support. After all, the Thames River of the time was as dangerous a source of drinking water as the polluted streams of ancient cultures. Dysen-

ANALOGY

Holding One's Temper

Physician and political figure Benjamin Rush used a thermometer metaphor in the early 19th century to illustrate the effects of alcohol. Even after realizing that alcohol abuse was a disease, Rush did allow for the benefits of moderate drinking, seen in the "Temperance" section of his chart.



CENTER OF ALCOHOL STUDIES, RUTGERS UNIVERSITY. *QUARTERLY JOURNAL OF STUDIES ON ALCOHOL*, VOL. 4; 1943

tery, cholera and typhoid, all using filthy water as a vehicle, were major killers and would remain so in the West as recently as the end of the 19th century, rivaling plague in mass destruction.

Only the realization that microorganisms caused disease and the institution of filtered and treated water supplies finally made water a safe beverage in the West. Religious antialcohol sentiment and potable water would combine with one other factor to make it finally possible for a significant percentage of the public to turn away from alcohol. That other factor was the recognition of alcohol dependence as an illness.

DISEASES OF ALCOHOL

THROUGHOUT THE 19TH CENTURY the application of scientific principles to the practice of medicine allowed clinical symptoms to be categorized into diseases that might then be understood on a rational basis. Alcohol abuse was among the earliest medical problems to receive the attention of this approach. Two graduates of the Edinburgh College of Medicine, Thomas Trotter of Britain and Benjamin Rush of the colonies and then the U.S., made the first important contributions to the clinical recognition of alcoholism as a chronic, life-threatening disease. The influence of moralistic antialcohol Methodism may have driven their clinical research, but their findings were nonetheless sound.

In an 1813 essay on drunkenness, Trotter described alcohol abuse as a disease and recognized that habitual and prolonged consumption of hard liquor causes liver disease, accompanied by jaundice, wasting and mental dysfunction, evident even when the patient is sober. Rush published similar ideas in America and to greater effect, given that he was a prominent member of society and a signer of the Declaration of Independence. His personal fame, behind his correct diagnosis of a societal ill, helped to create viewpoints that eventually culminated in the American Prohibition (1919–1933).

Nineteenth-century studies detailed the clinical picture and pathological basis of alcohol abuse, leading to today's appreciation of it as one of the most important health problems facing America and the rest of the world. Alcohol contributes to about 90,000 deaths in this country annually, making it one of the top 10 risk factors for poor health in the U.S. Although the exact number of problem drinkers is difficult to estimate accurately, America is probably home to about 17 million people whose lives are disrupted by their relationship with alcohol.

The overall alcohol problem is far broader. Perhaps 40 percent of Americans have been intimately exposed to the effects of alcohol abuse through a family member. And every year as many as 12,000 children of drinking mothers are robbed of their potential, born with the physical signs and intellectual deficits associated with full-blown fetal alcohol syndrome; thousands more suffer lesser effects. Pharmaceutical treatments for alcoholism remain impractical and inadequate, with total abstinence still the only truly effective approach.

Society and science are at the threshold of new pharmaceutical and behavioral strategies against alcoholism, however. As with any other disease, whether of the individual or the society, a correct diagnosis is crucial to treatment. Alcoholism, in historical terms, has only just been understood and accepted as a disease; we are still coping with the historically recent arrival of concentrated alcohol. The diagnosis having been made and acknowledged, continuing research efforts can be counted on to produce new and more effective treatments based on the growing knowledge of the physiology of alcohol abuse and of addictive substances in general.

Humanity at any moment of history is inevitably caught in that time, as trapped as an insect in amber. The mores, traditions and attitudes of an era inform the individuals then living, often blinding them to the consideration of alternatives. Alcohol today is a substance primarily of relaxation, celebration and, tragically, mass destruction. To consider it as having been a primary agent for the development of an entire culture may be jolting, even offensive to some. Any good physician, however, takes a history before attempting a cure. SA

Bert L. Vallee received his M.D. from New York University in 1943 and joined the faculty of Harvard Medical School in 1945. He was later appointed Edgar M. Bronfman Distinguished Senior Professor and a fellow of the National Academy of Sciences. He established the field of zinc enzymology and performed research on alcohol dehydrogenase, which led to his interest in the history of alcohol. Before his death in 2010, Vallee authored more than 600 scientific publications. He wrote this article in 1998; it was updated for this issue by Rachel Laudan, author of *Cuisine and Empire: Cooking in World History* (University of California Press, 2013).

THE HARD STUFF

Distillation created alcoholic drinks of unprecedented potency. This distillation apparatus appeared in Hieronymus Brunschwig's *Liber de arte distillandi de compositis,* the first book published on the subject, in A.D. 1500. The book featured these claims for distilled alcohol: "It causes a good colour in a person. It heals baldness… kills lice and fleas…. It gives also courage in a person, and causes him to have a good memory."

LIBER DE ARTE DISTILLANDI DE COMPOSITIS, BY HIERONYMUS BRUNSCHWIG, EDITION OF JOHANN GRÜNINGER, 1512 (copy held in Harvard Medical Library collection, Francis A. Countway Library of Medicine)

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