

The Pursuit of Intoxication: Our 100 Century-Old Romance with Psychoactive Substances*

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1. PREHISTORICAL ERA

Archeological studies have demonstrated the use of psychoactive substances by several methods. Poppy-seed caches have been found in a Turkish site several thousand years old. Statues have demonstrated drug use, such as ritual drug enemas in South America and incised poppy capsules on the headdresses of gods in ancient Crete. Wine vessels have been recovered from prehistoric ship wrecks in the Mediterranean [29, 94].

Observations of preliterate societies during historical times have occurred for over two thousand years. These reports by travelers, military leaders, traders, and missionaries have frequently included comments on alcohol and drug use. Ethnographies by trained observers have parenthetically mentioned alcohol or drug use over the last several decades. During recent decades, field work in preliterate societies has focused on alcohol and drug use as the central behavior under study [10, 77, 88].

As history dawned in various regions at various times (and is still dawning in some preliterate societies), a wide spectrum of psychoactive

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substances was in place. Beers and wines were obtained from grains, fruits, tubers, and mammalian milk (i.e., cows, horses, camels) in East Asia, through Europe, and into Africa. Cactus wines and beers, such as pulque, were prepared by the tribes and civilizations of Central America and southwestern North America [73]. Opium was described as a medicament from ancient Egypt to ancient China. Betel-areca stimulants were used recreationally and to relieve the boredom of heavy agricultural work from India through Southeast Asia, the Malay Archipelago, and much of Oceania [3, 11]. Cannabis in brews, soups, stews, and bakery was variously taken as a condiment, medicine, and recreational intoxicant from Southeast and South Asia, through the Middle East, into much of Africa [77]. Kratom, a stimulant leaf, was harvested from free-growing trees in Southeast Asia. Qat (or chat), another stimulant leaf, was harvested on the shores of the Red Sea [32, 50]. Africans showed ingenuity in extracting stimulants from beans and nuts, such as the cocoa bean and kola nut. World champions in developing new substances were the aboriginal inhabitants of the New World, who developed over 200 psychoactive substances from leaves, roots, barks, cacti, and vines. Examples include coca leaf, tobacco, peyote, and kinnikinick [25, 36, 40, 72].

Ingestion was employed throughout the world as a primary route of administration for alcohol, opium, cannabis, and other drugs. Chewing, with absorption via the buccal mucus membrane, was also widely used for drugs poorly absorbed through the gut, such as betel-areca and coca leaf. Beyond these two basic worldwide methods, the Americas again were the sites for innovation. Snuffing was used in South America, even involving blow guns (operated by a second person) to distribute the powder extensively throughout the nasal conchae and sinuses. Central American priests administered ritual drugs to their colleagues by enema [29]—a route subsequently adopted for administering medication by physicians in Europe. Volatilization of the psychoactive substance and inhalation through the lungs (i.e., smoking) was used in North America for tobacco and kinnikinick. Snuffing the smoking introduced a major advance in drug use: rapid onset of drug effect within several seconds as opposed to gradual onset over 20–30 min by ingestion and chewing. Enemas, like chewing, bypassed the acid environment of the stomach [25, 28].

During this era, social “time out” from usual roles at festivals, religious and political ceremonies, family and clan rituals, business transactions, and altered states of consciousness involved use of substances in many cultures. Adjunctive or alternate means to the same ends include fasting, sleeplessness,

social isolation, drumming, and dancing. These functions of drugs and alcohol continue with the use of wine at Catholic mass and Judaic feasts, peyote in the Native American Church, and hallucinogens among South American animists.

Chronic substance abuse was probably rare or nonexistent during much of this period. Carbohydrate stores were too limited to permit excessive use. Chronic or regular intoxication would endanger survival in hunter-gatherer and early gardening societies in which life was relatively short, starvation and infectious disease threatened lives, and risks to life from climate, animals, and/or enemies were great. Oral myths (later written) as well as historical and anthropological reports on preliterate societies do suggest that infrequent problems were associated with acute intoxication, including violence, trauma, and social and interpersonal problems [84].

2. AGRICULTURAL REVOLUTION TO 1500 A.D.

During this era, several developments changed substance availability and use dramatically. One such innovation was gardening and farming, which resulted in excess carbohydrate. It thus became feasible for some individuals to be freed of agricultural labor, and for stores of alcohol to be available for abuse. Complex social organizations led to a focus of power and wealth in the hands of a few, such that an elite, wealthy leisure class could indulge excessively in alcohol without imminent threat to community survival. Cash cropping in psychoactive substances appeared on a modest level during this era, at least for local or regional consumption, with increased local commerce in these substances (e.g., wine).

Classical substance use disorders were identified during this era. Delirium tremens as a complication to alcohol dependence and opiate withdrawal were described. Probably not as a coincidence, legal strictures against excessive or too frequent substance use began to appear. For example, Islam forbade any alcohol use when a fortress was overrun due to an intoxicated night guard, and the Aztecs enforced stringent measures against those drinking outside of prescribed roles and occasions [73]. These regulations reinforced the stable, traditional use of alcohol or other drugs in many societies. Opium remained largely a medication rather than a social intoxicant. Betel-areca, coca leaf, and other stimulants became associated with heavy, repetitive work in many areas, from taro farming in Oceania, to paddy rice farming in Asia, to precious metal mining in the Andes [11, 40].

3. POST-COLUMBIAN ERA: 1500 TO 1800

Long distance, relatively efficient sea commerce initiated a new era for psychoactive substances. Societies were exposed to new substances and to new methods of drug administration. For example, tobacco smoking and snuffing from North America spread rapidly to Europe and then to Asia. In return, distilled alcohol proved popular among tribes of North America which had no access to alcoholic beverages. Substances previously ingested in the Old World, such as cannabis and opium, were volatilized for inhalation through the lungs [82]. Traditional alcohol and drug use had been subject to highly regulated times and amounts but new psychoactive substances and routes of administration resulted in widely diverse consumption patterns, from abstinence to heavy use [13].

Further technological advancements took place in modifying psychoactive substances, especially alcohol. Distillation (probably Arabic in origin) spread rapidly, resulting in grain-based whiskeys, fruit-based brandies, and sugar-cane-based rum and gin. Carbonated rice wine was produced in Southeast Asia by burying the rice mash underground: carbonated grape-wine or champagne was made with special sturdy bottles and corks in France.

The first epidemics of psychoactive substance abuse occurred during this era. The Gin Epidemic in England was largely due to social, economic, and political issues, abetted by the Industrial Revolution. English vessels carried manufactured goods to the American colonies, starting in Canada and working south to the Caribbean where they loaded gin and other raw products as ballast and as trade goods for the return trip to England. Slave labor in the Caribbean and minimal import duty made gin calories cheaper than bread calories in England, with the result that alcohol became a dietary staple. Alcohol abuse thus became a social, health, and political problem. Fetal alcohol syndrome was first described at this time. This epidemic, which lasted several decades, gradually responded to diverse strategies: i.e., laws raising the duty on imported beverage alcohol; a shift in public opinion toward drinking guided by cartoonists and pamphleteers; and the appearance of several abstinence-oriented Protestant sects. While England was able to reduce its alcoholism, their antialcohol strategies did not spread to colonized peoples, such as the Irish and Australians, who have continued to have serious alcoholism down to recent times [51]. As English alcoholism problems were addressed, opium abuse spread to England [52].

Opium addiction epidemics occurred in several Asian countries, including Japan, China, and Thailand. These were preceded by tobacco smoking, a popular pastime condemned by the authorities in some areas. As stringent antitobacco laws were being implemented, opium smoking appeared and then spread and increased by massive proportions from the seventeenth to the nineteenth centuries. These national epidemics required literally centuries to quell (e.g., Japan, China), and some continue relatively unabated yet today (e.g., Burma, Thailand) [58, 81, 94]. Smoking was also applied to other substances such as cannabina, with endemic (rather than epidemic) casualties resulting [19].

An alcoholism epidemic began among many aboriginal North Americans in association with the fur trade [53, 56]. Cultural differences among tribes also appeared to make some groups more vulnerable to alcoholism than other groups [5, 54]. Intoxication facilitated or replaced traditional altered states of consciousness, such as the Spirit Quest [16]. Along with iron implements and fabrics, "trade alcohol" was a popular medium of trade. Many tribes still suffer the effects of these binge drinking practices initiated centuries ago [96]. Similar problems persist among indigenous peoples in Oceania and Australia [18, 35, 43, 69, 71].

Commerce in psychoactive substances figured large in initiating and perpetuating these epidemics. The gin trade across the Atlantic is perhaps the first example, with the "trade alcohol" to Amerindians occurring soon afterwards. European-dominated commerce in Indian-grown opium fueled the Asian opium epidemic, especially in China, Singapore, and Malaysia. Economic gains and losses in these trades led to military action, the Opium Wars in China being a prominent example. Tribal, national, and international politics were involved in repeated attempts to control these epidemics.

Relocation of substance use from one place to another often gave rise to, or at least symbolized, certain political conflicts. The Chinese emperors of the seventeenth century saw "tobacco smoking houses" as dens of iniquity. The English king perceived the American colonial tea houses in the same fashion. Recall that the "Boston Tea Party," an early blow against England, resulted from an English tax on Asian tea imported to the United States [37].

An "illness model" of alcohol-drug abuse began to evolve during this time. Benjamin Rush, a Revolutionary War physician in the United States, developed an early classification of alcoholics. Physicians attempted to

treat the acute phases as well as attempting abstinence-oriented rehabilitation in asylum settings.

During this era, adjacent groups with access to the same psychoactive substances began to use them in different ways; or one group might abstain completely while its neighbor used the substance. Substance use patterns thus assumed symbolic aspects and contributed to ethnic identity [75, 89]. In some instances this practice insulated individuals of particular groups against substance abuse, while individuals in other groups were at very high risk to substance abuse [4, 10, 17, 22 34]. Intoxication or chronic inebriety even became institutionalized as a distinct social role in many societies [23]. Shared psychoactive substance use could also provided a venue for interethnic contact and communication [41, 59, 97].

4. POSTINDUSTRIAL REVOLUTION AND THE MODERN ERA

Spread of the Industrial Revolution in the 1700s and 1800s stimulated cash cropping in psychoactive substances, including organized production of opium, tea, coffee, betel-areca, and grains and grapes for beverage alcohol. Old plant substances, such as opium and coca leaf, were purified so as to isolate their most active compounds, morphine and cocaine. Hollow needles made parenteral injection of psychoactive substances feasible, a method adopted by opiate addicts within several years of its development. Merchandising of opiate-containing patent medicines resulted in addicting hundreds of thousands of middle class women who were not part of drug subcultures and even isolated from each other—an achievement of modern marketing [68]. Rising disposable income was followed by increased per capita alcohol consumption in several countries—a trend which continued into the next century [12, 85]. Entire districts of major cities, called Skid Rows in the United States, became devoted to alcohol or opium sales, along with lodging and charity for chronic alcoholics and addicts. These modern Skid Rows and Opium Dens are now also occupied by homeless, mentally ill, and socially disabled people [60, 91].

The twentieth century has ushered in further developments in psychoactive substances. One feature has been the development of psychoactive chemicals synthesized entirely in the laboratory and not requiring a plant-based compound. Among the first of these were the barbiturates and amphetamines, followed later by synthetic opioids, hallucinogens, and other sedatives (e.g., benzodiazepines). Industrial solvents, general anesthetics,

and other petroleum-based volatile solvents have also been abused around the world for several decades [26]. Just when it appeared that all possible routes of administration had been exhausted, California brought the world the vaginal route of administration (usually in association with sexual activity). Epidemics of these new drugs have appeared during the modern era, just as earlier with alcohol and opium. For example, there have been literal outbreaks of amphetamine, cocaine, and heroin abuse over the last half century [38, 67, 68, 70, 86, 98].

Unlike schizophrenia and depression, psychoactive substance abuse requires an external agent, i.e., drugs or alcohol. Thus, it is a highly pathoplastic disorder which becomes manifest depending on local availability of and access to psychoactive substances, as well as sociocultural mores governing their use. Gambling, eating disorders, depression, and other disorders can coexist with or replace substance use disorders [1, 49]. Lifetime prevalence figures of 20 per 100 adults are possible with alcoholism and opiate addiction [80, 94], with lifetime risks perhaps twice as great.

While adolescent substance abuse has been known in the past, adolescent drug and alcoholic epidemics among the young have appeared only since the mid-twentieth century. This pandemic among youth has been reported on every major continent and in most countries [8, 14, 18, 20]. Even childhood drug experimentation has appeared. Youthful drug use has stimulated the search for cheap, readily available psychoactive substances in the home, school, workplace, grocery store, and hardware shop. Glue, paints, cleaners, solvents, aerosols, and various petroleum products have produced epidemic mental retardation in certain populations, such as in Mexico City and Indian reservations from the Mexican border to the Arctic [47]. African and Southeast Asian youth have also abused these substances. This youthful pandemic has resulted in alarming rates of adolescent suicide, school dropout, runaway, illegitimate pregnancy, and lack of preparation for mature socially integrated adult roles and functions.

A major dilemma in the modern era has been the danger of intoxication in the workplace and in other public places. Previously a farmer, ox cart driver, coolie, ditch digger, or small shopkeeper could cause limited social harm if acutely or chronically abusing psychoactive substances. Today that is no longer the case as workers can cause considerable harm to others and to high cost capital investments. Examples of such occupations include airline pilots, operators of machinery, bus drivers, physicians, and corporate executives. Even ordinary citizens can cause havoc driving modern vehicles or walking in areas of dense vehicular traffic [83, 90].

Rapid sociocultural change in some areas has further undermined traditional controls over substance abuse. Religious strictures have had reduced effect in secular-oriented societies as values become highly individualized rather than highly shared or universal [15, 92]. Rural-to-urban migration has reduced the influence of neighborhood and extended family on the individual. Divorce has crippled even the nuclear family in moderating psychoactive substance use. Corruption among police, military, customs agents, and political leaders in many regions has provided fertile settings for illicit drug production, commerce, and use. Countries which formerly had little or no substance abuse have developed serious problems with alcohol and/or drugs, including Greece, Israel, Italy, Japan, Spain, and Switzerland [8, 9, 27, 42, 46, 78]. Many new ethnic groups, the result of migration and intermarriage, have developed escalating substance abuse problems in the absence of clear traditions against substance abuse [33, 64, 87]. Colonialized, conquered, and otherwise displaced persons have also been at risk to epidemic substance abuse [61, 62, 65, 76].

As in previous eras, means to deal with these problems have erupted everywhere. Some of these have been rediscoveries of old methods, such as ascetic abstinence-oriented fundamental religiosity among Christian groups in the United States, Islamic and Judaic groups in the Middle East and South Asia, and certain Hindu and Buddhist sects in East and Southeast Asia [24, 48]. Increased taxation [74] has been rediscovered as a control mechanism, and not just as a revenue-producing resource. Prohibition has been attempted, with varying results [66, 93]. Peer methods to intervene and confront excessive users have been developed at many levels in diverse societies. Redefinition of substance abuse as a "disease" [44] or disorder has had important implications [95]. Treatment and support groups have appeared for the first time in churches and mosques, clinics and hospitals, schools and factories [6, 39]. Illicit alcohol or drug production and commerce, such as Irish *poteen*, has sometimes assumed anticolonial, pro-ethnic political overtones [21]. Cults many substitute for drug abuse with other types of altered states of consciousness, such as spirit dancing [45], or even involving sacramental drug use, such as the consumption for sacramental use of peyote by the Native American Church [2, 7, 57]. Other altered states, such as self-relaxation and meditation, have also been touted in lay and scientific literature [31, 79]. Cultural groups have actively sought to establish new norms for psychoactive substance use [55]. Parents have banded together to reinforce communal standards and values regarding psychoactive substances, substituting in part for older but defunct or ineffective social units. Stringent political changes,

even revolutions, have been required to reverse epidemic psychoactive substance abuse in some countries [63]. Despite these innovations, many countries still struggle with the problem of high relapse following treatment for substance abuse [30, 94].

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