

Historical and cultural aspects of man's relationship with addictive drugs

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*Our taste for addictive psychoactive substances is attested to in the earliest human records. Historically, psychoactive substances have been used by (i) priests in religious ceremonies (eg, *amanita muscaria*); (ii) healers for medicinal purposes (eg, *opium*); or (iii) the general population in a socially approved way (eg, *alcohol, nicotine, and caffeine*). Our forebears refined more potent compounds and devised faster routes of administration, which contributed to abuse. Pathological use was described as early as classical Antiquity. The issue of loss of control of the substance, heralding today's concept of addiction, was already being discussed in the 17th century. The complex etiology of addiction is reflected in the frequent pendulum swings between opposing attitudes on issues that are still currently being debated, such as: is addiction a sin or a disease; should treatment be moral or medical; is addiction caused by the substance; the individual's vulnerability and psychology, or social factors; should substances be regulated or freely available.*

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This paper endeavors to discuss (i) the cultural history of man's relationship with addictive drugs; and (ii) the historical roots of the science of addiction. The first part deals with addictive substances and their "normal" patterns of use across different epochs. The second part is about the recognition of *pathological use* and the appearance of the science of addiction, the definition of drug use as a disease and its inclusion in the medical constituency, and the evolution of views on etiology and intervention.

Our early ancestors lived as hunter-gatherers and—as shown by the culture of human groups who retained this lifestyle (eg, Australian aborigines, Amazon Indians, or Kalahari desert Bushmen)—they undoubtedly collected considerable information on pharmacological plants. Ötzi, the man whose frozen body was recovered in the Alps in 1991, lived about 3300 years BC, and carried in his pouch a travel pharmacy including a polypore fungus with antibacterial and hemostatic properties. After adopting a pastoral lifestyle, humans may have observed the effects of psychoactive plants on their flocks. Tradition has it that Ethiopian priests started roasting and boiling coffee beans to stay awake through nights of prayer after a shepherd noticed how his goats were frolicking after feeding on coffee shrubs.

Addictive substances and cultural patterns of use

Schematically, psychoactive substances have been used (i) in religious ceremonies by priests; (ii) for medicinal purposes; or (iii) massively, as staple commodities, by large segments of the population in a socially approved

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way. Dominant patterns of use varied according to epochs and places. An important parameter was the degree of a drug's acculturation. For instance, New World plants such as tobacco (nicotine) and coca (cocaine) are relative newcomers to the Old World. Conversely, poppy (opium) and hemp (cannabis) originated in Eurasia.¹ In contrast, alcohol can easily be produced by the action of yeast on a variety of plants containing starch or sugar, and has been used by virtually all cultures.² Surprisingly, however, alcohol was largely unknown throughout much of North America before the arrival of Europeans. The sudden destructive impact of alcohol on North American native cultures might be explained by the fact that traditional patterns of use had not been established; another possible factor may be the lack of previous genetic selection operating on vulnerable subjects over millennia.

Religious use

Priests or shamans have ingested plants for millennia to induce states of dissociative trance. Such substances are sometimes termed "entheogenic" (from the Greek roots "en" [inside], "theo" [god], and "gen" [create]). The mushroom *Amanita muscaria*, commonly known as fly agaric, has been at the center of religious rituals in Central Asia for at least 4000 years. Children know this beautiful white-spotted red mushroom from the illustrations of fairy tales and Christmas cards. *Amanita muscaria* had a religious significance in ancient India, and travelers recorded its use as late as the 18th century in Northeastern Siberia. It was an ingredient of *Soma*, a sacred beverage in the Rigveda in ancient India, and also of *Haoma*, a sacred beverage mentioned in the Avesta, the ancient scriptures of Zoroastrianism.^{3,4} Etymologically, *soma* and *haoma* are the same words. It has long been thought that muscarine, a cholinergic substance discovered in 1869 in *Amanita muscaria* (hence the name), was the hallucinogenic compound. In fact, the hallucinogenic compounds are ibotenic acid and muscimol. In Central America, psilocybe mushrooms were used for the same purposes. Mushrooms of this genus contain the psychoactive compounds psilocin and psilocybin. Indigenous people in pre-Columbian Mexico, and also the Navajo in the southwestern United States, used peyote (*Lophophora williamsi*) to trigger states of spiritual introspection. This cactus contains psychoactive alkaloids, notably mescaline.

Medicinal use

Some drugs have been used as medications for most of human history. For instance, the medicinal use of opium is described from the earliest written records. *Nepenthes pharmakon* is mentioned in the 9th century BC in Homer's *Odyssey* (4, 221). It is written that the beautiful Helen of Troy had received this potion from an Egyptian queen and that she used it to treat the Greek warriors ("presently she cast a drug into the wine of which they drank to lull all pain and anger and bring forgetfulness of every sorrow"). Since the 18th century, most exegetes have thought that this potion was prepared from opium. Interestingly, this preparation is qualified as a *pharmakon*, ie, a medication, in the Greek original. According to etymology (*ne*: no, and *penthes*: grief, sorrow), *nepenthes* would be an anxiolytic or an antidepressant in today's parlance. There is general agreement that the Sumerians cultivated poppies and isolated opium from their seed capsules at the end of the third millennium BC; they called opium "gil" (joy), and the poppy "hul gil" (the joy plant).⁵ The Ebers papyrus (c. 1500 BC), one of mankind's oldest medical documents, describes a remedy to prevent excessive crying in children using grains of the poppy plant, strained to a pulp, passed through a sieve, and administered on 4 successive days. Homer's *nepenthes* was perhaps similar to laudanum, an opium tincture attributed to Paracelsus in the 16th century. In the 19th century, laudanum was extensively used in adults and children, for numerous indications (insomnia, cardiac and infectious diseases). The working class largely consumed laudanum because it was cheaper than gin or wine, since it escaped taxation. In the early 20th century, encyclopedias in Western countries still stated that persons in good mental and physical health could use opium without risk of dependence. Griesinger (1817–1868), a German psychiatrist, one of the founders of modern psychiatry, recommended the use of opium in the treatment of melancholia.⁶

Recreational use

Some potentially addictive drugs have been used by a significant proportion of the population on a regular basis, to the point that they have been considered staple commodities. *Alcohol*, *nicotine*, and *caffeine*, being palatable for their mild psychotropic properties, are examples of widely consumed drugs. As licit psychoactive drugs, they

are used mostly by “normal” people, in contrast to illicit “hard drugs,” which are traditionally viewed as the province of the deviant.⁷ Alcohol, nicotine, and caffeine have permeated our culture, serving as vehicles for social interaction, shaping our urban landscape, from the Japanese teahouse to the British pub, stimulating the opening of international trade routes. Similarly, hashish (*cannabis*) has been largely consumed—eaten and later smoked—in Islamic cultures. All these substances have a long history, intricately interwoven with myth, bearing witness to man’s predilection for psychoactive substances. The oldest seeds of cultivated vines so far discovered and carbon dated were found in Georgia and belong to the period from 7000 to 5000 BC.⁸ According to Jewish and Christian tradition, one of Noah’s first actions after coming out of the Ark was to plant a vineyard; he drank some of its wine and became drunk (Genesis 9, 20-21). Coffee was largely used throughout the Islamic world at the end of the 15th century. Its use spread rapidly in Europe, and Europeans introduced coffee plants into their colonies. Tea’s history is much older, since the plant was already being harvested in China in the 3rd century BC.

These staple commodities have long been the object of official attention, for the purpose of collecting excise tax rather than controlling abuse. In order to extract revenues, rulers in Ancient Egypt and Babylon established production or sales monopolies.⁹ Ordinances limiting consumption have coexisted and alternated with free supply, in close temporal and geographic proximity. Temperance movements led to a clear decrease in liquor use in Western Europe in the early 20th century, culminating with prohibition in the United States (from 1920 to 1933) and in a few Nordic countries. In preceding centuries, tobacco and cannabis had also known prohibition. Smokers ran the risk of having their lips cut under the first Romanov tsar, Michael Fiodorovich, or of being beheaded under the Ottoman sultan Murad IV. In 1378, the Ottoman emir in Egypt, Soudoun Sheikhouni, was determined to stamp out hashish use: farmers growing hashish were imprisoned or executed, and those found guilty of consuming were said to have their teeth pulled out.¹⁰

Devising more potent compounds

In the course of history, many psychotropic plants have been refined and administered through new routes, allowing faster access to the brain in higher concentrations. The fermentation of cereals containing starch produces beer

with an alcoholic content of around 5%, whereas the same process with grape sugar yields wine containing up to 14% alcohol. Distillation made it possible to obtain beverages with a much higher alcohol content. People could drink alcohol with strength of 50% and more, making it easier to become drunk. The construction of stills, associating an alembic to distill a liquid with arrangements to condense the vapor produced, seems to have started only in the 11th or 12th century around the medical school of Salerno in Italy.¹¹ Distillation, though it did not create the problems with alcohol, could intensify them.¹² The “water of life,” as it was called in many languages (Latin *aqua vitae*) conquered Europe with great speed. That name still survives, as in the Danish *akvavit* and through the Gaelic *uisge beatha* to the English *whisky*. In England, drunkenness was to become connected with distilled spirits, especially gin, as dramatically pictured in Hogarth’s *Gin Lane*. Alcohol without liquid (AWOL) is a more recent process that allows people to take in liquor (distilled spirits) without actually consuming liquid. The AWOL machine vaporizes alcohol and mixes it with oxygen, allowing the consumer to breathe in the mixture. Vaporized alcohol enters the bloodstream faster, and its effects are more immediate than its liquid counterparts, producing a euphoric high. Traditionally, coca leaf is chewed in the regions of production in Southern America, for instance by Andean miners to diminish fatigue. At the other pharmacokinetic extreme, the smoking of crack cocaine produces short-lived and intense effects that are felt almost immediately after smoking. Opium is another example of a substance whose pattern of use changed in the last centuries, from a medication used for pain relief and anesthesia to a substance associated with abuse and dependence. Opium’s capacity to induce dependence was probably bolstered by the recent purification of morphine, and the synthesis of heroin, more potent compounds that are available for injection. Similarly, cigarettes, which allow nicotine to be rapidly absorbed into the bloodstream and to reach the brain in a few seconds, were associated with more dependence than previous modes of tobacco use (snuff, cigars, chewing) which did not promote deep inhalation into the lungs.

The historical roots of addiction medicine

Chronological milestones

Abnormal patterns of substance use have been described since antiquity, at least since Alexander the Great’s death

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in 323 BC was precipitated by years of heavy drinking. Aristotle recorded the effects of alcohol withdrawal and warned that drinking during pregnancy could be injurious.¹³ The Roman physician Celsus held that dependence on intoxicating drink was a disease.¹⁴ The birth of addiction medicine in modern times is sometimes credited to Calvinist theologians who offered explanations for the phenomenon of compulsive drinking, which were later accepted by physicians.¹⁵ Dr Nicolaes Tulp, a Dutch physician depicted in Rembrandt's painting "The Anatomy Lesson," adapted theological models to explain the loss of control over various types of behavior (1641). In this process, what was considered sinful behavior was given medical explanations. A few decades later, one of Tulp's colleagues, Cornelius Bontekoe, applied his teaching to the progressive loss of willful control over alcohol intake. With the colonial era, industrial revolution, and international trade, addiction became a global public health problem. In the 18th century, opium's addictive potential was recognized when a large number of Chinese people became addicted, and the Chinese government tried to suppress its sale and use. In Europe, the working classes were threatened by alcoholism.¹⁶ At that time, psychiatry had matured into a scientific discipline, established nosological classifications, and taken stands on societal issues. The American physician Benjamin Rush, writing in the 18th century, maintained that compulsive drinking was characterized by a loss of self-control, and that the disease was primarily attributable to the drink itself and not the drinker. His remarks concerned only strong liquors; wine and beer, in his view, were salutary thirst-quenchers.¹⁷ In German-speaking countries, the most influential physician was Constantin von Brühl-Cramer, who is credited with coining the term "dipsomania" ("Über die Trunksucht und eine rationelle Heilmethode derselben" [1819]). Dedicated medical journals were created in the 19th century. The *Journal of Inebriety* appeared in the United States in 1876, while the *British Journal of Addiction* was first published in 1884. Emil Kraepelin, the physician who exerted the greatest influence on the shaping of modern psychiatry, fought alcohol with extreme dedication.¹⁸ He published the first psychometric data on the influence of tea and alcohol in the early 1890s. As a result of his research, he came to the conclusion that chronic alcoholism provoked cortical brain lesions that led to a permanent cognitive decline. Drawing from personal consequences, Kraepelin became a teetotaler in 1895. Before that, he had been a moderate

drinker, recognizing alcohol's relaxing and mood-elevating effects, as in this letter to the psychiatrist August Forel in December 1891: "...I have often found that, after great exertion, and also after severe mood depression, alcohol has had a clearly beneficial effect on me...."¹⁹ Kraepelin was particularly concerned about the social and genetic consequences of alcohol. Sigmund Freud, a contemporary of Kraepelin, laid the ground for the psychological approach to addiction. Freud wrote in a letter to Fliess in 1897: "...it has dawned on me that masturbation is the one major habit, the "primal" addiction and that it is only as a substitute and replacement for it that the other addictions—for alcohol, morphine, tobacco, etc—come into existence."²⁰ A consequence of the psychological approach is that the addiction to different substances (alcohol, opiates, etc) and even to certain types of behavior, such as gambling, have been gathered together under a common denominator, and regarded as different expressions of a single underlying syndrome. Interestingly, the Qur'an warns against both wine (*khamr*) and gambling (*maisir*) in the same sura (2, 219). In the 20th century, addiction medicine has been enriched by (i) diagnostic classifications and (ii) neurobiological and genetic research. Louis Lewin published his influential classification in 1924, distinguishing between stimulants (nicotine; caffeine-containing compounds such as coffee, tea, mate); inebriants (alcohol, ether); hallucinogens (lysergic acid diethylamide [LSD], peyote); euphorians (cocaine; opium derivatives such as morphine, codeine, heroin); and hypnotics. Also, animal research and functional brain imaging studies in humans have led to the current influential hypothesis that all drugs of abuse share a common property in exerting their addictive and reinforcing effects by (i) acting on the brain's reward system and (ii) conditioning the brain by causing it to interpret drug signals as biologically rewarding or potentially salient stimuli comparable to food or sex. Cues associated with morphine, nicotine, or cocaine activate specific cortical and limbic brain regions. This conditioning involves the prefrontal cortex and glutamate systems. However, in rats, this pattern of activation displays similarities to that elicited by conditioning to a natural reward—highly palatable food such as chocolate.²¹ Confronted by cues that serve as drug reminders, the individual experiences craving, and the degree of voluntary control that he or she is able to exert may be impaired. This hypothesis is partly derived from Pavlov's conditioning paradigm, where food is equated to cocaine, the animal's salivation to cocaine craving, and the

bell to the drug cue.²² Family, adoption, and twin studies have demonstrated the intervention of genetic factors in addiction,²³ notably in alcohol abuse and dependence. Genetic factors interact in a complex way with the environment.²⁴⁻²⁶

Addiction—history of a word

The definition of addiction has evolved over time. Today, addiction is defined by the characteristic features that are shared by a variety of substances: (i) the pattern of administration can progress from use, to abuse, to dependence and (ii), as discussed in the previous paragraph, a common feature of several substances is that they induce pleasure by activating a mesolimbic dopaminergic reward system, and dependence by mechanisms involving adaptation of prefrontal glutamatergic innervation to the nucleus accumbens.

The term “addiction,” in its current medical meaning, was used first in English-speaking countries, and then passed on to other languages that had used other terms previously. For instance, addiction has displaced the words *toxicomanie* or *assuétude* in French. Interestingly, the word *assuétude* (from the Latin *assuetudo* [habit]) had originally been introduced into French in 1885 to translate the English *addiction*.²⁷ German uses non-Latin roots, such as *Abhängigkeit* (dependence), *Sucht* (addiction), and *Rausch* (intoxication). In Roman law and in the Middle Ages, addiction was the sentence pronounced against an insolvent debtor who was given over to a master to repay his debts with his work. Thus, the *addictus* was a person enslaved because of unpaid debts. According to the *Oxford English Dictionary*, the term “addict,” in the meaning of “attached by one’s own inclination, self-addicted to a practice; devoted, given, inclined to” has been used since the first part of the 16th century. However, addiction, in its current medical meaning of “state of being addicted to a drug; a compulsion and need to continue taking a drug as a result of taking it in the past” has been in widespread use only since the 20th century. In medical English, addiction replaced older terms, such as “inebriety.”

The difference between the terms dependence and addiction has long been debated. The meaning of these terms among public health professionals can only be understood in the light of their historical development. Addiction is defined as “strong *dependence*, both physiologic and emotional” in Campbell’s psychiatric dictionary.²⁸ In 1964, the

World Health Organization recommended that the term drug *dependence* replace *addiction* and *habituation* because these terms had failed to provide a definition that could apply to the entire range of drugs in use. Historically, the archetypal model of addiction was opiates (opium, heroin), which induce clear tolerance (the need to increase doses), severe physical withdrawal symptoms when use is discontinued, and have serious consequences for the social, professional, and familial functioning of users. The spread of the concept of addiction to other substances, notably nicotine, occurred only in recent decades.²⁹ The diagnosis of tobacco dependence or addiction did not exist in the *Diagnostic and Statistical Manual of Mental Disorders*, 2nd ed (*DSM-II*, American Psychiatric Association in 1968).³⁰ In the *Diagnostic and Statistical Manual of Mental Disorders*, 4th ed (*DSM-IV*)³¹ this diagnostic category was called “nicotine” dependence instead of “tobacco” dependence. A similar historical evolution was observed with the International Classification of Diseases (ICD), the World Health Organization’s Classification of Diseases: the *ICD-10 Classification of Mental and Behavioral Disorders. Clinical descriptions and diagnostic guidelines (ICD-10)*, published in 1992,³² contains a category for tobacco dependence, whereas the previous classification, the *International Classification of Diseases*, 9th Revision (*ICD 9*),³³ devised in the mid 1970s, had no such specific category and offered only a category for nicotine abuse. The current labeling of “dependence” in the *Diagnostic and Statistical Manual of Mental Disorders*, 4th ed, Text Revision (*DSM-IV-TR*)³⁴ is confusing. During the preparation of the *Diagnostic and Statistical Manual of Mental Disorders*, 3rd ed, revised (*DSM-III-R*),³⁵ committee members disagreed as to whether “addiction” or “dependence” should be adopted. A vote was taken at a committee meeting and the word “dependence” won over “addiction” by a single vote! As pointed out by O’Brien, the term “addiction” can describe the compulsive drug-taking condition and distinguish it from “physical” dependence, which is normal and can occur in anyone taking medications that affect the brain.³⁶ For instance, pain patients requiring opiates become dependent, but are not automatically addicted.

Conclusion—a complex illness

Cultural history suggests that our relationship with drugs is more complex than the paradigm of the laboratory rat that is trained to self-administer cocaine. In most cases, we actively seek addictive drugs, and are not passive vic-

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tims. History illustrates that our relationship with substances is shaped by multiple factors, including culture, society, religion and beliefs, individual psychology (addictive, anxious, antisocial personalities), cognition (addiction as a “learned” behavior), neurobiology, and genetics. Addictive behavior results from the conjunction of a substance and a personality. Addiction is not only a substance, but the way a person uses it. In other words, it is not only the drink, but also the drinker, as illustrated by the following dialogue in Shakespeare’s *Othello* (Act 2, Scene 3): Cassio—“*O thou invisible spirit of wine, if thou*

hast no name to be known by, let us call thee devil” ... Iago—“*Come, come. Good wine is a good familiar creature, if it be well used.*” The etiological complexity of addiction is illustrated by a history of pendulum swings of social and medical opinion. There is no resting equilibrium on unanimous beliefs. It has been common to observe, at the same time and in the same place, the confrontation of opposing attitudes on issues such as: strict vs broad definition of addiction (eg including gambling or not); laissez-faire or prohibition; punishing or treating the addict; and individual responsibility. □

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Aspectos históricos y culturales de la relación entre el hombre y las drogas adictivas

En los primeros registros humanos hay testimonios de nuestro gusto por sustancias psicoactivas adictivas. Históricamente las sustancias psicoactivas han sido utilizadas por: 1) sacerdotes en ceremonias religiosas (ej. *amanita muscaria*), 2) curanderos con propósitos medicinales (ej. *opio*) ó 3) la población general de una manera socialmente aceptada (ej. *alcohol*, *nicotina*, *cafeína*). Nuestros antepasados refinaron compuestos más potentes e idearon vías más rápidas de administración, que contribuyeron al abuso. El uso patológico ha sido descrito desde la Antigüedad Clásica. El tema de la pérdida del control de la sustancia, precursor del concepto actual de adicción, ya fue discutido en el siglo XVII. La compleja etiología de la adicción está reflejada en las frecuentes oscilaciones del péndulo entre actitudes opuestas en temas que actualmente siguen siendo debatidos como: si la adicción es un pecado o una enfermedad; si el tratamiento debe ser moral o médico; si la adicción es causada por la sustancia, la psicología y la vulnerabilidad del individuo o por factores sociales; y si las sustancias deben ser reguladas o estar disponibles libremente.

Aspects historiques et culturels de la relation entre l'homme et les substances addictives

Le goût de l'être humain pour les substances psychotropes addictives est attesté par les sources historiques les plus anciennes. Historiquement, les substances psychotropes ont été employées 1) par des prêtres, dans des rituels religieux (p. ex., l'*amanite tue-mouches*), 2) par des guérisseurs, à des fins thérapeutiques (p. ex., l'*opium*), ou 3) par la population générale, d'une façon sanctionnée socialement (p. ex., l'*alcool*, la *nicotine* et la *caféine*). L'homme a modifié les substances disponibles pour intensifier leurs effets et accélérer leur absorption, ce qui a favorisé l'abus de ces produits. Des modes de consommation pathologiques sont décrits dès l'Antiquité classique. La question de la perte du contrôle sur la substance, à l'origine du concept actuel de dépendance, est déjà analysée au XVII^e siècle. L'étiologie complexe des addictions se traduit au cours des siècles par des oscillations entre des attitudes opposées, toujours débattues aujourd'hui : les addictions sont-elles un péché ou une maladie, et le traitement doit-il être moral ou médical ? ; l'addiction est-elle causée par la substance, ou par la vulnérabilité de l'individu et par des facteurs psychologiques et sociaux ? ; l'accès aux drogues doit-il être libre ou bien régulé ?