

# Addiction

The Science of Substance Abuse & the Search For a Cure



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## Drug Demons in History.

### Alcohol



**"In my judgment such of us who have never fallen victims [to alcoholism] have been spared more by the absence of appetite than from any mental or moral superiority over those who have. Indeed, I believe if we take habitual drunkards as a class, their heads and their hearts will bear an advantageous comparison with those of any other class."**

**--Abraham Lincoln**

During the Puritan Era, alcohol was the "good creature of God," the social centerpiece in taverns throughout the colonies. The phenomenon of the village drunkard was easily understood: He was simply the person in town of the lowest moral fiber.

One of the first physicians to argue that habitual drunkards were "addicted" was Dr. Benjamin Rush, a signer of the Declaration of Independence, America's first professor of chemistry, a fervent believer in copious blood-letting, and the author of the 1812 treatise, "Medical Inquiries and Observations upon the Diseases of the Mind," for which he is considered by some to be the father of American psychiatry. Rush was a controversial figure, touted by many as a heroic innovator and by others as something of a quack. Rush strenuously emphasized "depletive" remedies—anything that made the patient bleed, sweat, retch, or blister.

As for alcoholism, Dr. Rush considered it a "disease of the will" resulting in loss of control over drinking behavior, and curable only through abstinence. He recommended the creation of "sober houses" where drunkards could acquire the habit of abstinence. John B. Gough, a well-known presence on the temperance lecture circuit, called alcoholism a sin, "but I consider it also a disease. It is a physical as well as moral evil." [MORE...](#)

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### Nicotine



**"The use of tobacco is growing greatly and conquers men with a certain secret pleasure, so that those who have once become accustomed thereto can later hardly be restrained therefrom."**

**--Sir Francis Bacon**

The prototypically North American contribution to the world drug trade has always been tobacco. Tobacco pipes have been found among the earliest known Aztec and Mayan ruins. Early North Americans apparently picked up the habit of "drinking the smoke" from their South American counterparts. Native American pipes subjected to gas chromatography show nicotine residue going back as far as 1715 B.C. "Drinking" the smoke of tobacco leaves was an established New World practice long before European contact. An early technique was to place tobacco on hot coals and inhale the smoke with a hollow bone inserted in the nose.

The addicting nature of tobacco alarmed the early missionary priests from Europe, who quickly became addicted themselves. Indeed, so enslaved to tobacco were the early priests that laws were passed to prevent smoking and the taking of snuff during Mass.

New World tobacco quickly came to the attention of Dutch and Spanish merchants, who passed the drug along to European royalty in the 17th Century. In England, American tobacco was worth its weight in silver, and American colonists fiercely resisted British efforts to interfere with its cultivation and use. [MORE...](#)

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## Marijuana



**"We drank bhang and the mystery I AM HE grew plain. So grand a result, so tiny a sin."**

**--Quoted in J.M. Campbell, "On the Religion of Hemp," Indian Hemp Drugs Commission, 1893-4.**

The Prohibition Years also sparked a rise in marijuana use and marijuana black marketeering. To checkmate the migration toward that drug, Congress passed the Marihuana Tax Act of 1937, modeled closely after the Harrison Act. The American Medical Association opposed this law, as it had opposed the Harrison Act, but to no avail. The assault on marijuana was led by Harry J. Anslinger, the indefatigable U.S. Commissioner of Narcotics who served a Hoover-like stretch from 1930 to 1962. At one point, Anslinger announced that marijuana was being taken by professional musicians. "And I'm not speaking about good musicians," he clarified, "but the jazz type." Due in no small part to Anslinger's tireless public crusade against "reefer madness," additional state and federal legislation made marijuana penalties as severe as heroin penalties. The most famous early victim of Anslinger's efforts was screen actor (and reputed jazz fan) Robert Mitchum, who was busted in 1948 and briefly imprisoned on marijuana charges.

American cannabis hysteria was in marked contrast to marijuana attitudes in other parts of the world. A British customs agent, attempting to catch the flavor of cannabis use in India during the early 1900s, explained that, for Muslims, marijuana is "the spirit of the great prophet Khizr or Elijah." Islamic poets, the customs officer writes, honor marijuana with the title of Warak al Khyall, or Fancy's Leaf, "from its quickening the imagination." Some historians claim to have traced the medicinal use of marijuana back at least as far as the 1st or 2nd Century C.E., when the Chinese physician Hua T'o allegedly used a boiled hemp decoction to anesthetize patients during abdominal surgery. [MORE...](#)

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## Opium



**"Opium has been recently made from white poppies, cultivated for the purpose, in Vermont, New Hampshire, and Connecticut....comparatively large quantities are regularly sent East from California and Arizona, where its cultivation is becoming an important branch of industry, ten acres of poppies being said to yield, in Arizona, twelve hundred pounds of opium."**

**--Massachusetts Government Health Report, 1871**

The history of brain science probably began about 4,000 B.C., somewhere in Sumeria, when human beings first discovered the extraordinary effects of the unripened seed pods of the poppy plant. Modern neuroscience owes a great debt of gratitude to this tame-looking plant drug and its sticky, incredibly potent byproduct called opium. Neuropharmacology—the study of the action of drugs on the nervous system—would never have advanced so quickly without it.

Historically, the emphasis has been on opium's cash value, not its value to science. A trade staple on the Silk Route for centuries, opium was very nearly the perfect business. The present-day drug companies, known collectively as Big Pharma, are not the first capitalists in the world to exert an unprecedented grip on drug retailing. One of the less-civilized aspects of the early British Empire was its control of the opium trade in China and India. Perhaps the most sordid drug war in history was fought not to protect a nation from drugs, but for exclusive rights to market them.

From roughly 1720 to the late 1800s, the merchants of the British East India Company ran a brisk and lucrative opium business with the Oriental "heathens." In 1839, the British went to war with China to maintain unlimited trading rights, and when the Chinese authorities seized and burned British opium shipments on the Canton River, the "street" price for addicts in China went up drastically—with no discernible effect on demand. The British won the war, retained unlimited marketing rights to opium in the Orient, and picked up the island of Hong Kong in the bargain. [MORE...](#)

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## Amphetamine



**"High concentrations are achieved with each inhalation, and sent right upstairs to the brain—but not all of the brain simultaneously. The target of the flow of blood is the limbic system, whereas the remainder of the brain is exposed to much milder concentrations."**

**--James Halikas, M.D., University of Minnesota**

Originally intended as a prescription drug for upper respiratory ailments and the treatment of narcolepsy (sleeping sickness), the drug was first synthesized in 1887 by a German pharmacologist. It was a British chemist named Gordon Alles, however, who showed everyone just what amphetamine could really do. There was no direct analog in the plant kingdom for this one. Alles, who also worked at UCLA and Caltech, documented the remarkable stimulatory effect of "speed" on the human nervous system—research that led directly to the commercial introduction of amphetamines in the late 1930s under the trade name Benzedrine. Once it became widely available over the counter in the form of Benzedrine inhalers for asthma and allergies, it quickly became one of the nation's most commonly abused drugs, and remained so throughout the late 1950s and 1960s.

For people suffering from depression, an oral dose of amphetamine lifted their mood even better than cocaine had lifted the morose spirits of Sigmund Freud. During World War II, American, British, Japanese and German military commanders frequently ordered the use of Benzedrine and the newer Dexedrine for "non-medicinal" purposes by their respective soldiers. The effects tested right before our eyes, and the drug proved essentially useful for less distressing social behavior among and between pilots.

ordered the use of Benzedrine and the newer Dexedrine for “non-medical” purposes by their respective soldiers. The effects lasted eight hours or more, and the drug proved especially useful for long-distance aerial bomber crews and fighter pilots.

In the end, users paid dearly for the energy surge provided by speed. Anxiety, confusion, inability to concentrate, prolonged exhaustion, and severe depression were all common symptoms of amphetamine withdrawal. Chronic use resulted in paranoia, delusion, and psychosis. In Japan, the practice of providing government amphetamine to civilian factory workers during World War II led to serious social disruptions by war’s end. By some estimates, 2 per cent of Japanese adults were addicted to amphetamine. [MORE...](#)

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### Cocaine



**“Cocaine made me feel like a new man. Unfortunately, the first thing the new man wanted was more cocaine.”**

**--George Carlin**

After the isolation of morphine from the poppy came other plant drug extractions: digitalis from foxglove, quinine from cinchona trees--and cocaine from the leaves of a squat bush found in South America. If the Orient was the center for opium products; if the ancient Arab world was largely responsible for popularizing coffee (the Persian philosopher Avicenna records its use in the Near East in the 11th Century); then historically South America had its distinctive offering as well. In the high Andes, the use and cultivation of coca by the native population of Incas had been commonplace since at least the 10th Century. This drug became better known in our time by the name of its primary active ingredient, cocaine. Historians suggest that cocaine was first brought to Europe by returning conquistadores, and ultimately became a popular anesthetic for cataract removal and dental surgery. Less than one hundred years later, it had become a seriously abused stimulant all over the world.

Cocaine was marketed legally in the late 1800s by Parke, Davis in the United States, and by Merck and Co. of Germany, among others. Touted as a general “brain tonic” and a non-addictive cure for depression, as well as an alternative to opiate and alcohol addiction, cocaine appeared in wines, chewing gum, powders--and in Coca Cola, the “temperance drink.” (Reportedly, Coke contained 60 milligrams per eight-ounce serving, or roughly one modern snort). There were coca cigarettes, cordials, and salves. One bottling company even offered a soft drink simply named “Dope.” [MORE...](#)

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### Caffeine



**“A morning without coffee is like sleep.”**

**--Author Unknown**

Recent studies have documented the existence of severe caffeine addicts who suffer significant depression and lessened cognitive capacity for several weeks or months following termination of coffee drinking. Balzac, the nineteenth century French writer, reportedly died of caffeine poisoning at roughly the 50-cup-per-day level.

Supermarket coffee in a can has considerably more caffeine per brewed cup than gourmet blends. Robusta beans have more caffeine than Arabica varieties. Instant coffee is the most potent coffee of all.

Some countries and cultures prefer coffee, and others tea, and the young of all countries prefer caffeinated soda drinks--but caffeine is caffeine. This psychoactive alkaloid is more widely available than alcohol and nicotine, since it is not prohibited below the age of 18. There is scarcely a café or a grocery store anywhere in the world that does not offer caffeine for sale in one form or another. Caffeine scoots through the blood-brain barrier with ease, and blocks adenosine receptors with alacrity. Like nicotine, it can be a sublime and surprisingly powerful drug, which leaves the head clear and does not cause lethargy or markedly alter consciousness.

Balzac notwithstanding, coffee is almost never lethal in overdose. Caffeine clears the body quickly. As with alcohol, the same amount of caffeine affects women more strongly than men. In addition, women on birth control pills metabolize caffeine much more slowly. Pregnant women do, too, and this is one reason they are often advised not to drink it. [MORE...](#)

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### Carbohydrates



**“Statistics show that of those who contract the habit of eating, very few survive.”**

**--George Bernard Shaw**

Amino acids in the foods we eat serve as the raw materials for the production of neurotransmitters. What we eat alters the chemistry of the central nervous system. Diet affects neurotransmission. “Food consumption,” wrote Dr. Neil Grunberg, one of the scientific editors of the Surgeon General’s 20th Report on Tobacco and Health, “may be considered as self-administration of a psychopharmacologic agent.”

The proper functioning of the brain depends critically upon proper nutrition. Tryptophan, an amino acid present in milk and many other foods, is a “precursor” for serotonin, meaning that tryptophan is used by certain cells in the body as the raw material for the manufacture of serotonin. Since two of serotonin’s functions are the regulation of sleep and the production of feelings of contentment, the idea of drinking a glass of milk in order to relax before bedtime is not just an unsupported folk remedy for insomnia. Other substances found in foods have similar effects on neurotransmission. Certain meats like pork and duck, for example, have high concentrations of tyrosine, an amino acid that serves as a precursor for dopamine. And chocolate, that perennial snack favorite, not only boosts serotonin levels, but also contains small amounts of phenylethylamine, a chemical substance which turns out to be a distant cousin of the amphetamines.

Since serotonin pathways in particular are involved in the control of appetite, individuals who are prone to drug addiction and depression might be prone to certain eating disorders as well. Or, to put it another way, what do alcoholism, drug abuse, depression, suicide, impulsivity, bulimia, and an excessive appetite for carbohydrate foods have in common?

“It can’t be coincidence that we’ve had this tremendous increase in illicit drug use among adolescents almost coinciding with the epidemic in eating and sexual disorders, at the same time neuroscientists are saying drugs of abuse access brain sites normally used for species survival reward,” according to Dr. Mark Gold, professor of neuroscience at the University of Florida College of Medicine. [MORE...](#)

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