Humans have used drugs for thousands of years and, although deplored today, they may once have been essential to our survival. Rarely today is anyone out of reach of an addictive substance. Most people like a drink now and then. Many of us struggle to get by without a coffee first thing. Or how about the way a prescription drug can take the edge off our anxiety in times of stress ... but some people don’t merely use these substances, they can’t live without them. What makes one person an addict while another can easily put down the glass or forgo the salving pleasures of pharmacology? Addiction can be defined as continued use in the face of obvious harm. The circle of harm includes physiological damage to the addict as well as pain for the addict’s family and friends. Health officials insist addiction is an illness that needs treatment and which can be cured, but no one is quite sure exactly what this illness is all about. Originally, scientists assumed addiction was a matter of psychological reinforcement. Certain substances produce a buzz, or remove physical or emotional pain, and so people often want more. Given that explanation, addicts were weak-willed hedonists who just couldn’t get enough fun. But during the 1990s, scientists started to understand that the pleasurable reinforcement wasn’t simply hedonism, but rather brain chemistry. They looked on the neurotransmitter dopamine, which lifts mood and induces euphoria. Alcohol and certain drugs can take people on a dopamine high, but when the chemicals wear off, some people’s brain chemistry doesn’t return to normal levels, it dips below, landing them in a ‘dopamine deficit’, with increased craving for the lost ‘high’. According to Nora Volkow, Director of the U.S. National Institute on Drug Abuse in Bethesda, Maryland, addicts are also neurochemically unable to make good decisions. She found that low levels of dopamine receptors are associated with lower glucose metabolism in the frontal lobe of the brain, the place that regulates decision-making and inhibition. Similarly, low levels of the neurotransmitter serotonin appear to be implicated in addiction because people with low levels of serotonin often have poor impulse control. And, as a result, they drink or take drugs to excess. But this isn’t to say that having a genetic predisposition for poorly regulated brain chemistry is invariably the factor that causes a person to become an addict. Compulsive substance abuse is also a human behaviour deeply affected by personal history and environment. Utilising animal models, including rats and monkeys, researchers have discovered that how an animal is housed, how it socialises, its rank in its group, and the care it received as a baby all bear on how it modulates dopamine and serotonin, no matter what it's genetic make-up. For humans too, life experience influences who takes what. In fact, addiction is now widely believed to be a ‘biobehavioural disorder’: a product of the influence of chemistry and experience on each another. But if addiction is such an entirely negative human experience, why is it that so many people are addicts? Evolution may be at fault.
According to Randolph Nesse, an evolutionary psychiatrist at the University of Michigan, at some time in humanity’s distant past, individuals whose brains had a heightened response to emotion-linked neurotransmitters (such as dopamine and serotonin) were better adapted to survival. This meant that as the generations passed, heightened response became established as the norm.

Unfortunately, these days heightened response is anything but advantageous; the psychoactive substances we manufacture are so pure and so concentrated that in susceptible people they can rapidly boost some neurotransmitters to pathological levels - causing addiction.

Archaeologists have found evidence of kola nut (caffeine), khat (an amphetamine-like plant), tobacco (nicotine), betel nut, and coca, at various sites dating back at least 13,000 years, indicating that humans have, in fact, been drug users for a very long time. Across the globe, people in non-Western cultures are very familiar with these and other mind-altering substances.

“It’s widely believed that human drug use is a quite new and pathological phenomenon,” says Roger Sullivan, an anthropologist at California State University at Sacramento, “But psychoactive plant toxins were a mundane occurrence in the environments of hominid evolution, and so our ancestors may have been exploiting plant drugs for very long periods of time.”

Both Sullivan and Edward Hagen, of Humbolt University in Berlin, believe that compulsively seeking these items in the past might have been adaptive during times when nutrients were hard to find. Our ancestors may have relied on them to fend off stress, hunger, fatigue, low mood, or craziness. For humans, whose large brains were dependent on high levels of neurotransmitters, ingesting these compounds might have been ‘good’ rather than ‘bad’. In the forests and savannahs of our evolutionary past, using these compounds may actually have been a ticket to survival, not an escape from reality.

The significant difference these days is that the power of such psychoactive compounds can be amplified many times over, and large quantities are available on demand - putting many humans at risk of becoming addicts. What may have helped us survive as a species long ago may, it seems, have done us no favours.

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