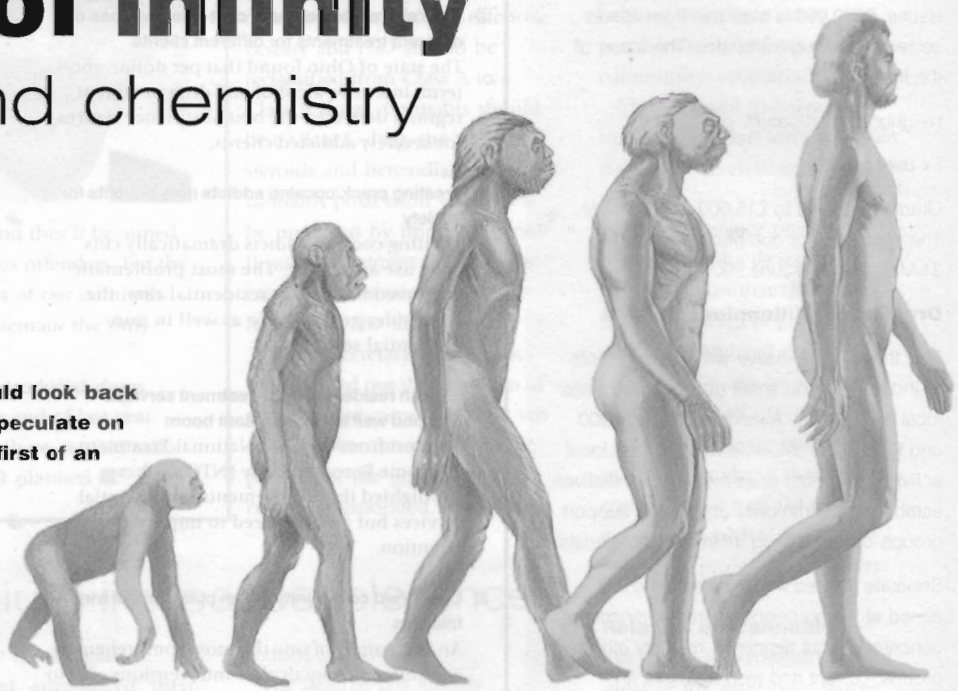
feature

Harry Shapiro

A taste of infinity

Evolution and chemistry



It seems appropriate in 2001 we should look back to the earliest days of human life to speculate on our introduction to drugs, in this, the first of an occasional series on drug history

Over millennia humans have built up intense and complex relationships with substances that can change the way we feel and the way we perceive the world. Drugs have always been seen as mysterious, fascinating, exotic and dangerous. They have opened the mind to inner space, alternate worlds, different wavelengths, and allowed humans to walk with gods or call forth demons.

We anthropomorphise them, treating drugs as people, giving them names like John Barleycorn, Mary Jane, Girl, Charlie, Henry. Rock star Lou Reed sang of heroin, 'it's my life, it's my wife.'

The ritual of drug use is another indicator of how deeply ingrained intoxication has become as a facet of human behaviour. There is no drug use which does not have its accompanying rituals, involving preparation and equipment developed through trial and error over hundreds or even thousand of years.

Consider the multiple blendings and reblendings that go to make the finest whiskies and brandies, stored in special barrels for decades at exact temperatures. The professional rituals of expert wine, coffee and tea tasters. The curing techniques for commercial tobacco preparation, and the intricate ceremonies and rituals of psychoactive plant use among tribal communities all over the world.

For the injecting heroin user, the ritual of shooting up can be just as important a part of the experience as the drug in the syringe. And how close that seems to the ritual of preparing coffee – grinding the beans, warming the cafetière, pouring in the hot water and then pushing down on the syringe-style plunger releasing the flavour of rich, dark coffee.

Brain chemistry

Our relationship with drugs goes deeper still, right into the chemistry of our being. The brain uses chemical messengers with 'shapes' that 'fit' to cells as a key fits a lock. There are billions of these locks or receptors in the brain, on the outer surface of every nerve cell. Chemicals from outside the body can also fit these locks – drugs. When the 'right' drug key enters the brain, it locks into the receptor site.

The science writer Colin Tudge has suggested that our bodies might actually need psychoactive drugs in the way that our bodies have evolved to need vitamins. He wonders whether 'the whole sorry spectacle of depression, anxiety and obsession' is a consequence of 'pharmacological impoverishment'.

It comes as no surprise then, that whatever their views on drugs, many authors on the subject begin the discourse by stating that drugs have been with us since 'the earliest days of recorded history' or since 'time immemorial', 'the dawn of man' and so on. Writers as diverse in their views as Andrew Weil[1] and Ronald Siegel[2] agree on this point.

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Weil believes that the drive to alter our states of consciousness is innate in human beings. This is not only achieved through the use of drugs – Weil cites one example of very young children who spin around for no other reason than to get dizzy.

Siegel calls the drive to intoxication, 'the fourth drive', after hunger, sex and thirst, but states that this is adaptive rather than innate. It is something we learn to do, such as love, make friends or strive for power – an activity over and above primary biological needs.

The dawn of drugs

Can we make any educated guesses as to when humans first experimented with mind-altering substances? How could this have come about? Do current theories stand up?

The earth is about 4.5 billion years old, but it wasn't until around 600 million years ago that the first plants appeared which were capable of causing altered states – fungi such as mushrooms.

Later on, around 345 million years ago, flowering plants first appeared. For reasons which are not clear some plants developed physical and chemical defence mechanisms – they might be poisonous, or have the capacity to sting, or injure would-be consumers with thorns, bristles, barbs and spikes.

Some caused intoxication through chemical weapons called alkaloids, which constitute about one per cent of the plant and have no known metabolic function in plant life other than to deter hungry herbivores.

Most of the drugs taken throughout history have been plant derived: opium, cannabis, coca, alcohol, tobacco, and a whole host of psychedelic vines, snuffs, mushrooms and cacti containing some of the most powerful hallucinogens on the planet.

In the wild, animals are very adept at learning which plants to eat and which to avoid. They develop safe feeding strategies, and methods of communication to warn others about unpleasant tasting plants. Yet, hawkmoths, ants, bees, grasshoppers, koala bears, goats, tigers, monkeys, fruit bats, robins, cats, boars, jaguars, reindeer and mongooses, have all been observed returning time and again to specific plants that appear to have no nutritional value. They simply get the animal stoned and they seem to enjoy it.

It is reasonable . . . to assume that human beings would have observed animals becoming intoxicated on particular plants

It is reasonable, therefore, to assume that human beings would have observed animals becoming intoxicated on particular plants or from rotten, fermented fruit. They would have had plenty of time for observation. The earliest hominids split from those that became primates around 4.5 million years ago and developed to *Homo sapiens* at an incredibly slow and incremental rate until around 30,000 years ago.

Only then, does it seem that we had a fully developed a fully cognitive brain. Before then, all the theories of the evolution of the brain and consciousness suggest that we could have done little else, when watching animals become intoxicated, than copy them and fall over ourselves. The discovery of intoxication could have come at any time – perhaps animals copied us. But until we had a fully joined up cognitive brain, beyond the primitive brain with its divided chambers and narrow, limited thought processes, it is likely that we had no obvious means of interpreting any plant-induced altered state of consciousness we might have experienced.

Thought provoking

Some have suggested that it was the plants themselves that helped us on the way to acquiring cognitive functioning. One theory came from ethnobotanist Terence McKenna.

Dubbed a latter day Leary, McKenna was keen to promote a rosy future for psychedelics in society. This is most popularly expressed in *Food of the Gods*, an interesting and thought provoking book let down by a rather desperate attempt to construct a glorious past to validate his halcyon projections.

His scenario (which he admitted 'some might call a fantasy') took off from the correct assumption that nobody has come up with a conclusive explanation as to the reason(s) why the hominid brain grew so quickly in (geologically speaking) such a short space of time. Until around one million years ago, our brain sizes through all the species of hominids were roughly the same as our nearest relatives, the chimpanzees.

The human brain then went through two great leaps of 'encephalisation' until the brain of *Homo sapiens* was four times the size of the chimpanzee. McKenna suggested that a catalyst must suddenly have propelled human development forward and his candidates were psychedelic drugs.

McKenna focuses on two aspects of human evolution for the role of psychedelics – the success of the hunter-gatherer lifestyle, and more profoundly, the development of language.

The first drug

Psychoactive plants flourish in many parts of the world in all kinds of climatic conditions. But for such a plant to have influenced very early pre-linguistic hominids, it almost certainly needed to be found in Africa. It so happens that unlike the Americas, Europe and Asia, Africa is mysteriously bereft of psychedelic plants. Aside from Iboga, there is little else except one species of mushroom, *Stropharia Cubensis*, which does contain the active ingredient of 'magic mushrooms' psilocybin.

McKenna linked this with the existence of zebu cattle as the mushroom grows only in its manure – but suggested a relationship

between humans and the cattle verging on domestication, for which there is no evidence until thousands of years later.

McKenna speculated on two roles for the mushrooms. The first relates to hunter-gatherer lifestyles. Psilocybin mushrooms increase visual acuity so (said McKenna), this would improve a hunter's ability to catch prey. This in turn would increase the amount of food available for his group, meaning stronger offspring, more likely to survive and so natural selection would favour the mushroom-eating groups over those who abstained.

Drug speak

McKenna's second theory was an even greater leap of faith, in that the effects of eating psilocybin mushrooms in a pre-linguistic society somehow caused a brain mutation which created enough 'joined-up thinking' in the brain, for language to develop. Obviously, there is no direct evidence for any of this, but then that applies to many theories about human development. The problems with McKenna's theories are more grounded.

While these mushrooms may have improved sight, they would not have improved hunting – how are groups of people each stoned out of their brain on magic mushrooms supposed to be focused enough to co-operate on a hunting expedition? The use of psychedelic plants in modern day tribal communities is restricted to specific ceremonies concerned with initiation, healing and divination, not for the difficult and demanding activity of hunting, often dangerous, animals. There is no reason to believe that earlier hunter-gatherer communities would have behaved any differently.

Another problem is that for the mushroom/vision advantage to be replicated through enough generations to make a difference, it would need to have become a genetically-embedded ability, not just passed on by learned behaviour.

A further objection covers both of McKenna's speculations. There is every chance that the hominids at the state of development where McKenna suggests that psychedelics played god, could not have coped with these mind-bending plants either as individuals or as a group.

It is hard enough for highly literate people to convey the ineffable nature of the psychedelic experience, as the many dreary tales of tripping illustrate. Early hominids must have had some way of communicating and one must be wary of taking an overly-empirical western scientific approach.

Nevertheless, without some kind of reasonably sophisticated language, it seems impossible that early humans could have meaningfully conveyed information to the rest of the group as to what was happening to them. And that in a world where just about everything must have been inexplicable – from the daily setting and rising of the sun, to the violent climatic upheavals of prehistory.

Observations of animals intoxicated in the wild report that some go off by themselves rather than risk ostracism or even violent retribution from other group members who would react against any signs of non-conformist behaviour. Survival for hominids with relatively primitive brains would depend on routine and habit to secure regular supplies of food. Creative leaps of the imagination, risk taking and 'walking on the wild side' of life would probably have been beyond them and a threat to their survival.

Stress factors

In *The Centre of the Universe*,[3] William Moxley endorses these criticisms of McKenna while trying to construct an alternative theory of the origins of the psychedelic society. He begins with careful consideration of the scientific evidence of human development to come to some conclusion about the most likely time frame for psychedelic drug use as a factor in evolution.

Moxley, too, considers why we might have developed a larger brain. Traditional theories have suggested that natural selection favoured those who could make the best tools, the 'tools maketh the man' idea. But the earliest known hominids had a larger brain than an ape of similar size and, as far as is known, had no greater reliance on tools. Bigger brains came before better tools.[4]

Moxley favours another theory, also propounded by Richard Byrne in his book *Machiavellian Intelligence*, whereby humans needed bigger brains to deal with the increasing complexities of social intercourse in a growing population, such as dominance relationships, alliances, group undertakings, lengthy childhood and so on. A larger brain needed more energy, so more food, so better co-operation within a group to hunt and gather successfully.

Potentially poison

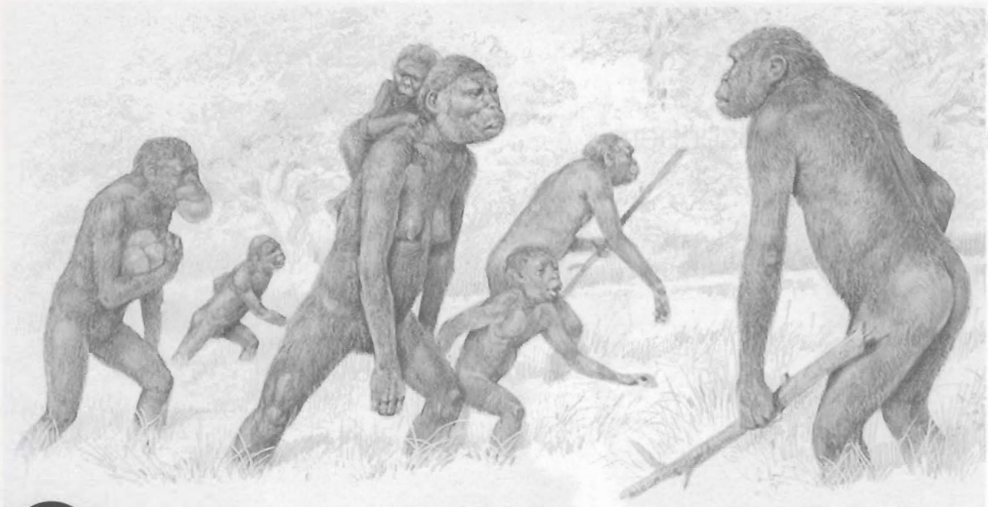
As it happens, this is an even greater block to experimentation with food as the need to avoid potentially toxic plants would be more crucial in this environment. Parent apes, for example, tend to pull their offspring away from unfamilar foodstuff.

Moxley points out that it was precisely because humans acquired a larger brain for the storing of the complex data required for more sophisticated socialisation (such as memory) that also allowed for the implementation of creativity, 'that was far more random trial and error'. In other words, it would allow for behaviour that was not absolutely tied to the demands of physical survival.

But remember, Moxley is trying to pin down the era of a psychedelic dawn for mankind and here is where the scenario begins to break down. From 20,000–10,000 years ago appears to be crucial for human evolution.

The beginning of this period was an era of global warming, as earth entered an inter-glacial period. This claims, Moxley, 'seems to provide exactly the kind of opportunities for the disruption and crisis conditions for groups of human predecessors that would lead to the discovery of psychedelic drug use'.

There were dramatic changes in



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the climate – early humans might, in some areas, have had to forage further afield. There would have been increasing competition for food from other groups, life would have been harsh, but why should this be an environment more conducive to plant drug use – unless you sign up to the idea that relieving stress is a key function of most drug use?

As this period progresses, there is evidence that the human population reduced from an estimated 100,000 individuals to perhaps only 10,000. Moxley points out that just because a society discovers psychedelics, it doesn't mean that they embark on a period of rapid change. In fact, he notes that (on the evidence of tribal communities) such societies are remarkably stable, environmentally aware, less likely to rush headlong into potentially disastrous technological change.

Yet this is, in a sense, what happened exactly to that group of humans who were supposed to have undergone the inter-glacial psychedelic awakening. This small group of remaining humans went out of Africa to dominate the world.

Visions

Where does that leave us in the search for any real indication that the use of psychedelics left their mark on our very earliest history? I think if psychedelics had a role to play, it would have been at a point beyond the emergence of the fully cognitive brain, when the walls of the primitive divided brain were breached, all the thinking joined up and the creative imagination was 'born'.

Over a period of time, perhaps as tribal organisation became more complex and could support 'specialists' within the group, artistic abilities that had been developing gradually were suddenly kick-started by visions induced into now fully cognitive minds by the ingestion of psychedelic plants.

Many of the geometric shapes of very early art found all over the world are striking in their resemblance to the visions reported by those under the influence of psychedelic drugs – archetypal patterns, circles, swirls and more angular shapes.[5] Also, 'contextual visions', for example, South American shamans see jaguars and anaconda snakes.

Possibly the most incredible artefact from that long distant past is an ivory statue, 28cm tall found in southern Germany – a man with a lion's head carved from the tusk of a mammoth. It is the earliest work of art known and represents a remarkable combination of technical expertise and powerful imagery.

Some human being 30,000 years ago had the imagination to conceive of a man with the head of an animal. Nowadays, it doesn't sound that amazing. But before that time, the thought patterns to imagine such an entity, not found in the real, waking, and immediately observable world, would have probably been impossible.

Such a surreal image from so long ago could have had a psychedelic provenance, as humans began to think about their own history and their relationship to the natural world around them.

Battle of brains

The 'right brain' for the drug experience was also incredibly complex. It could be that the genesis of our ambivalence over drugs began in the very complexity of the brain – the battle between higher and lower brain functions that developed over millions of years – basic drives conflicting with rationalism, reason, and constraint. Apollonius versus Dionysus.

For many years the idea of the triune brain held sway, suggesting the human brain had evolved over the eons by laying one structure upon the other. Modern research suggests another pattern – the different brain systems work in tandem, integrated by many two-way connections.

For example, the amygdala, buried in each temporal lobe, houses the main circuits that colour our experiences with emotion. It doesn't just get the signals from the lower levels of the brain such as loud noises, but also complex, abstract information from upstairs. Emotion is triggered not just by basic fears like spiders or snakes, but by seeing a loved one in trouble, hearing on the evening news of some latest outrage committed by the human race or watching your football team getting stuffed in an important cup tie.[6]

Human life is riddled with contradictions and dissonance. At one level we know that death is final, but grasp for improbable alternatives. We kill people in the name of a loving God. We believe our children are the future, then abuse them. Perhaps the make-up of our mind is the reason why we can't make our minds up about drugs ■

1. Weil, A. *The natural mind*. Houghton Mifflin, 1972.
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