

MIND ALTERING

Professor David Nutt researches drugs that affect the brain and conditions such as addiction. Sacked as the government's chief drugs adviser in 2009 for saying cannabis was less harmful than alcohol, he speaks to commissioning editor Rachel O'Brien about society's relationship with drug consumption

🐦 @ProfDavidNutt

O'BRIEN: It seems that human beings have always sought mind-altering substances, but there are particular moral concerns around the consumption of drugs; a sense of purpose about living straight. Yet, this does not apply to alcohol in the same way. Is that just because alcohol is legal and drugs are not, or is there something much more profound about our fear of drugs?

NUTT: There are three things that define humans. One is drug-taking, the others are language and culture. Those are the three things that separate our species from other species. One credible perspective on this is that the drinks industry started seeing competition from drugs in about 1860. In the 1860s you could go down and buy your tincture of cannabis, codeine, heroin, morphine or cocaine, and you could buy your alcohol. Over the past 150 years, the drinks industry has managed to get rid of all competition. It has done that by terrifying people into believing that drugs are bad and alcohol isn't. The reason I got sacked from the government's Advisory Council on the Misuse of Drugs (ACMD) was for saying that cannabis is less harmful than alcohol. No one disputes that. And yet, we still can't change our drug laws to fit with the facts.

In the UK, alcohol is now the leading cause of death in men under the age of 50. Last year's data showed a 6% increase in alcohol-related mortality in women in one year; an unprecedented rise in alcohol deaths in women. It will be the leading cause of death in women under 50 within the next two or three years. And we do nothing about it because the drinks industry has so much influence over policy.

O'BRIEN: You mentioned your sacking from the ACMD in 2009. How has that

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experience shaped how you feel about the balance between your ability to influence policy and the freedom inherent in scientific study?

NUTT: I am not an advocate of drug taking, except for scientific research. I'm not trying to change the law because I want to change the law. I'm trying to make the law do what it's supposed to do, which is protect people by being evidence-based. But if you start to argue that the law is wrong, based on evidence, then you somehow become an activist. That is about framing. You say then: "Oh, he's just an activist, he's not a scientist." Maybe that's why I'm scarier to them, because I am a scientist.

I spent nine years chairing the ACMD committee that assessed the harms of drugs. During that time I developed the most sophisticated way of assessing drug harms there's ever been. We came to a conclusion: that our drug laws are completely wrong. Then you're faced with a challenge: you're working in a system where you know that the law is not evidence-based and therefore it's unjust. There are people going to prison for periods that are completely inappropriate. The drug that people get the longest prison sentence for is MDMA; a drug that is less harmful than alcohol attracts the longest prison sentence.

Over the years it became clear that successive UK governments have only been interested in making drug laws harder. The Misuse of Drugs Act was brought out in 1971, and in that period of 40 years now, only one drug has ever moved down a class. Loads of drugs have moved up and got heavier penalties, but only cannabis has moved down. And that created such political havoc that eventually it was moved up again. Our drug laws aren't based on evidence.

You realise the drug laws are not only wrong, but probably doing more harm than good. But at the







same time, you are responsible for trying to promote the government's position on the drug laws. It was not possible to reconcile these two positions; one's politics and one's science, and in the end, if you don't put science first, you're not a scientist.

O'BRIEN: Recently, your work has focused on the study of psychedelic drugs. What have you discovered about how they affect the brain?

NUTT: Psychedelics are a very interesting group of drugs because they work on the most important system in the brain: the one that is where you have consciousness. It's a very difficult system to study. In fact, when we started doing the psychedelic work, you could only study that system by blocking it. Back in 1984 we did the first blocking study of the psychedelic receptor in the brain and to our amazement not much happened, except people had very deep sleep. But to study this receptor properly you have to stimulate it, and the only way to do that was with psychedelics. So about 12 years ago I thought OK, it's time to bite the bullet: I'm sufficiently old now, I'm the government's chief drugs adviser, if anyone can do this experiment I can. So, working with the Beckley

Foundation, we started doing this research by using the magic mushroom ingredient, psilocybin, because magic mushrooms are ultra-safe. We gave people the psilocybin in a scanner and looked to see the changes related to the psychedelic experiences. With people reporting interesting psychedelic experiences, such as seeing wonderful lights floating around and taking a trip out of the scanner to the moon, you'd expect to see some activation in the brain. But there was no activation, just three areas of the brain switched off.

We thought, this was absurd; you're turning off the brain, not turning it on. In fact it was such a strange result that we repeated the experiment using a different kind of brain imaging and got exactly the same result. Then we realised that the key parts of the brain that are being turned off are the parts that control the brain.

The process of becoming a human being is about making your brain work in the same way as all other human beings. That's why we speak the same language, we understand concepts that we're all talking about. Humanity is about making each brain do very much the same thing, or at least with socially important interchanges. That process takes decades and it becomes extremely fixed. Under psychedelics the nodes that control the brain are switched off, allowing the

brain to do its own thing. It's like an orchestra. A conductor will play exactly the music that Bach or Beethoven wrote. And if you as a musician don't get it note perfect, you'll be sacked. But if you take away the conductor and the orchestra can do its own thing, then you end up with jazz, which breaks down traditional musical barriers.

O'BRIEN: That is partly amazing and partly terrifying. We know more now about brain plasticity, particularly in the teenage years. To what extent is our fear of that 'opening up' actually about mental health? A fear that drug use could leave us in a state that we do not want to be in?

NUTT: In theory, but in practice it doesn't. Before LSD was made illegal, the National Institute of Health in America funded 140 separate studies; 40,000 patients were studied over 15 years. And actually the outcomes for those patients were better than if they hadn't been in a treatment at all. The point is it didn't cause problems. There are other more recent studies too; one from Arkansas showing that prisoners who use psychedelics when they leave prison are less likely to go back, presumably because they change the way they view the world. They can see there's a way of living that isn't criminal. We've got masses of data, from European and American studies, that people who use psychedelics have better mental health. They also live longer. Probably more people have died trying to jump from balcony to balcony in Magaluf when drunk than have ever died jumping under LSD.

Our experiment is an example of what you might call 'pure' science leading to a medical breakthrough. We did this because we were interested in what a psychedelic experience was. Your brain is full of these receptors; we've got more psychedelic receptors in our brain than any other species. And in the bits of the brain that you're using to do your thinking now, there are more of them than anywhere else in the brain. So why are they there?

Experiments with LSD show that in the psychedelic state the brain is much more what we call entropic, much more flexible, connections are more fluid. Under psychedelics, bits of the brain that haven't talked to each other since you were a baby can talk to each other. But one of the other strange things was that when people came out of the scanner, they often said: "Wow that was an interesting experience. And actually I feel better." And of course, history tells us that people take these drugs because they make them feel better. So we looked at the brain scans to see if there was anything in the brain that made sense of this. And we discovered that the part of the brain that causes depression is switched off by magic mushrooms and LSD. And we know that many other treatments for depression switch off that bit of the brain.

O'BRIEN: You crowdfunded part of the LSD imaging study. Do you think this will prove to be a trend in academia? Presumably you did it because it was harder to get government funding for those things?

NUTT: The only money we've ever got from the government to research these drugs was to do that depression study, because depression is a such a big problem. And we were right; psychedelics do switch off that part of the brain and people will get better from depression, even if they've been depressed for years, even if they've failed on other treatments.

We've never got government funding to do the broader brain research. They just think it's too reputationally risky. When we did the first ever ecstasy imaging study, about five years ago now on Channel 4, the day after that programme went out, an MP asked, under parliamentary privilege, if I had a licence to do the study and what would the grounds be to revoke that licence. So we have MPs trying to stop the research, enquiring of the home secretary was she aware that Professor Nutt had done a study with an illegal drug! The idea that science could be determined by whether drugs are legal or illegal, the idea that a politician could even think that, I find chilling. What's even worse is that he was the only pharmacist in the House of Commons.

O'BRIEN: Do you have a sense that the public is actually more informed now when it comes to drugs and policy? In your view are there reasons to be cheerful?

NUTT: I think my sacking was a transition point. For the first time, there was a public debate about drugs. Until I started saying that actually cannabis was less harmful than alcohol, no scientist would dare say it. Because they knew they'd get sacked. But after I was sacked everyone asked: "Is what he's saying true?"

My own view is that there are two things that will change the public mind. The first is the neuroscience argument. When we give these drugs to people, their brains don't fry. Our recent paper on changes in the brain connections after psilocybin treatment for depression was the highest impact paper in neuroscience last year. So people are interested. The second is the therapeutic value of these drugs. It's outrageous that we don't have medical cannabis. Cannabis was a medicine, put it back as a medicine. The psychedelic drug psilocybin was a medicine in the 1950s and 60s, put it back as a medicine. And that pressure, I think, is going to be the most important. Because why would you deny someone who's going to take 20 years off their life because they're an alcoholic access to a drug like psilocybin, which won't harm them? Why would you deny that?