SEX, DRUGS

AND

ROCK 'N' ROLL

The science of hedonism
And the hedonism of science

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INTRODUCTION

What makes us special? *Homo sapiens* may not be the pinnacle of evolution – but we are certainly singular. There is no living thing quite like us. But what exactly is it that makes our species so unique?

The question of just what makes us who we are has occupied our complex, anxious brains since the moment we became self-aware. It is a scientific puzzle, and furiously difficult to answer.

What does it mean to be human?

Is it consciousness? Self-awareness? Mathematical prowess? Linguistic adeptness?

Our name tells us a fair amount about what we think of ourselves: *Homo sapiens*: Latin for 'wise man'. The thinky monkey. We think we're so clever.

Since we put pen to paper, we have aggrandised our 'higher' cognitive capacities as the keys to what demarcates us from the rest of the animal kingdom. We can write things down, add numbers together, think about the past, present and future, and worry ourselves to death over everything we have the capacity to consider.

Moreover, our unrivalled mind may be what makes us human, but it is also what makes us profoundly miserable, anxious and confused. Perhaps we connect with something deeper within

ourselves by losing it. Do sex, drugs and rock 'n' roll constitute the three best ways to lose your mind? And does thinking less do us some good now and then?

Meanwhile, our supposedly 'base' pursuits – getting laid, getting high, rocking out – have been relegated to the bin of 'animalistic' impulses. Sex, drugs, and music have been denigrated as primal instincts: pleasurable and powerful, but biologically unimpressive. Animals also copulate, self-dose and make noise. Surely the written word and the mathematical graph are more impressive evolutionary achievements?

But not all human cultures possess writing, the number zero, agriculture, architecture, or many of our supposedly more impressive achievements. Yet all human cultures are united by an embrace of 'base' pursuits. We all enjoy red-hot ruts, take filthy drugs, and make riotous sounds. Sex, drugs and rock 'n' roll are universal characteristics of the human condition. We might like to deny that we are drawn to them, but we are undeniably hooked. And have been since the beginning.

We deem such impulses 'hedonistic'. There are many definitions of the word hedonism, but the phrase 'sensual self-indulgence' fits quite nicely. Saucy treats which are irresistibly alluring yet not necessary for survival.

But if they are universal surely our hedonistic tendencies must teach us something about what it means to be human?

Over the past four centuries scientists have revealed that our sexual, narcotic and musical characteristics are biologically unsurpassed.

We are one of the few mammals with a fleshy penis lacking a bony support, which means that the mind – complex beast it is – is integral to our capacity to copulate. On the other side of the gender coin, the clitoris seems to be the only organ designed for pleasure alone. It contains more nerve endings than any other

corner in the body. It is at the same time ancillary, inessential and spectacular. Its presence in our species is noteworthy.

Perhaps most striking: orgasm. It does not seem that anything that has ever graced God's green earth has ever experienced the height and duration of orgasmic experience as we humans.

We are lucky.

Politicians and self-righteous tee-total pontificators might intone us to stay away from drugs, but our evolutionary heritage has instructed us to do otherwise. The hallucinogens in magic mushrooms and LSD lock into our body's keyholes for serotonin more easily than serotonin itself. We might never have discovered our body's own soothing painkillers, the endocannabinoids, were it not for our everlasting love for weed. And the morphine produced from the poppy plant remains the most powerful anaesthetic ever devised – no laboratory technician has ever beaten it in the contest to produce the world's best painkiller. As usual, Plants 1: Humans 0. We do drugs thanks to millions of years of botanical burglary.

The predisposition to take drugs, no matter how lethal or poisonous, is part of what makes us who we are. It is integral to the human condition. Sex and drugs can both trigger the release of exhilarating biochemicals. And so can music. Your favourite tunes could send shivers up your spine even more powerfully than a new lover or a crusty chemical.

Music – the strange, amorphous thing it is – holds even more intriguing and mysterious clues to the roots of our humanity. Not only could the oldest human creation ever recovered be an instrument – a 40,000 year old flute – ochre paintings indicate we scoured caves as sound technicians in our earliest prehistoric days. Music is ancient, and spectacularly specific to our species. We would not be human were it not for our insatiable desire to crank up the volume.

Sex, drugs and music have all served as divining rods that led us to understand what makes our species the way it is. The pages of this book are filled with countless and exuberant examples of what scientists have discovered: why sex, drugs and music are important. Truth is stranger than fiction, and biology is art.

That sex, drugs and music are crucial components of human nature is probably intuitive to most. But here's the less obvious truth: were is not for our supposedly 'base' impulses, we never would have achieved many ground-breaking scientific discoveries. Hedonism has been integral to intellectual progress.

This is a story about scientists and their craft: a story of rebellion. There is redemption in disobedience.

Reprobation is redeeming. We might never have tracked down many of the most important chemical messengers of the mind were it not for our relationship with illegal narcotics and what they taught us about how the brain works. We understood nicotine before acetylcholine, caffeine before adenosine riphosphate, opium before endorphins, and hallucinogens before the serotonin.

Moreover, mind-bending drugs led to profound intellectual insights. Were it not for LSD, we might not know how to unravel the language of DNA with the ease we can today. Psychedelics may have also been integral to the quantum physics renaissance. Nobel Prize winners have attributed their discoveries to mind-bending psychedelics.

This is not just a story about what scientists have discovered, or why naughty treats made us who we are. This is a story about scientists and their craft, and how hedonistic impulses inform our highest pursuits. How the renegades of science have illuminated the secrets behind our deepest impulses. To deny our hedonistic instincts is intellectually stunting.

Science is ubiquitously stereotyped as an uninspired reduction

of life's exhilarating complexities into humdrum mundanities. Take something special, mark it on a graph, and debase it into an insipid uninspired scatterplot of dots and lines, robbing the human condition of all subtlety and nuance.

Nothing could be further from the truth. Not only has science taught us how important our hedonistic impulses are, but in many ways, science would have never progressed were it not for these insatiable drives in the first place.


SEX

EVOLUTION'S CLIMAX

For the vast majority of animals, the act of reproduction is fairly banal: she spreads her eggs over the ground, he spreads his sperm over them, and they both walk away without further contact or responsibility. Most fish, frogs, insects and, of course, plants create more of themselves without anything beyond a cursory spurt.

The main purpose is simple, and one of the mechanisms behind all evolutionary change. When making more little members of your species, rather than just creating an exact copy of yourself (cloning – still habitually practised by many micro-organisms, insects and plants), you might do better by shuffling the genetic deck of cards. By mixing your genes with somebody else's, you potentially leave behind descendants that are an improvement on yourself: bigger, stronger, faster, smarter. In other words: better adapted to their environment. That's the ultimate reason for procreation in the first place: taking a chance by throwing DNA's dice.

In most species, reproductive roulette is done without pomp and circumstance. Spread, spaff, done. But things just get weirder, and more interesting, from there. Evolution is the mother of invention, and sexual reproduction has been the engine driving the formation of some of life's most bizarre behaviours, chemistries and anatomies. The shape of sex in the animal kingdom spans the ridiculous to the sublime.

And sometimes the very awful.

Rape is the habitual mode of reproduction for a few species of duck.[1] Only 3 per cent of bird species boast external male genitals. Of the few that do, rape (or 'forced copulation') frequently results in death of the female by drowning. Males of the common

1. Common mallard (*Anas platyrhynchos)* females contain vaginas that swirl, and males in turn bear penises that twirl. Male on the right, female on the left.

mallard *Anas platyrhynchos** (Latin for 'broad-snouted duck') bear contorted, spiralled penises. Female ducks in turn contain swirling vaginal structures designed to thwart male attempts to sire offspring. American biologist Dr Patricia Brennan estimates only 4 per cent of forced copulations result in ducklings (60 per cent of matings in this species of duck are consensual).[2]

* A quick explanation of the name *A. platyrhynchos*: All species, such as our own, *Homo sapiens*, are classified by biologists in a Latinised two-word system known as 'binominal nomenclature'. Some titles are indisputably pretty, such as *Pipistrellus pipistrellus*, the common brown bat of England. Its relative, wearing the less pretty name *Myotis lucifugus,* the little brown bat of North America, features a strange two-stage mating system. In the 'active' system both partners are awake. In the 'passive' system males copulate with sleeping bats – regardless of their sex.

Female mallard vaginas turn and twist, peppered with numerous cul-de-sacs which they use to divert an assailant's sperm into dead ends. Researchers speculate the two genital structures have co-evolved in an escalating 'arms race'.

Female praying mantids famously devour the heads of their lovers – who continue to copulate unabated. 'Love darts' are a common weapon of romantic warfare in slugs and snails. Males pierce holes in the side of a female's body before shoving his sperm haphazardly into her abdominal cavity. Hyena females are burdened with a birth canal that extends directly through the clitoris, and are thus required not only to fornicate but also to give birth through the organ, which is so large it has been dubbed a 'pseudopenis' by zoologists.

Even familiar species mate in bizarre fashions. The penises of cats bear barbs about a millimetre long formed of keratin (the same material that constitutes your fingernails). Adding insult to injury, the barbs point backwards. Interestingly, these do not deter females from seeking male attention. Lionesses, for example, may mate up to a hundred times a day during the fertile portion of their cycle. Cat tongues are also covered in sharp keratinous shards, which one would think would make the act of oral sex rare. But it does occur elsewhere in the animal kingdom. Hyenas have been known to indulge in oral sex, along with gibbons and goats.[3]

Feline penile spines are designed to displace the sperm of other males who have sojourned with the same female. Dislodging the competition is a common function of elaborate phallic structures throughout the animal kingdom (including possibly ourselves). Curiously, the scraping of spines inside the feline vaginal canal is *required* to induce the hormonal transformations that spur ovulation and allow fertilisation to occur. Hence the term for cats and other animals that do not have cyclic

ovulation (like us) but need some form of physical or chemical trigger: 'induced ovulators'. Kittens are the product of vaginal lacerations.

But the very worst kind of animal sex I can think of is found in the deep-sea squid *Moroteuthis ingens*. Males dart females with sperm-filled bullets called spermatophores. This is nothing special: most species of squid transfer sperm from male to female through specialised capsules, usually inserted directly into her receptive cavity. But what makes the mode of reproduction in *M. ingens* particularly alarming is that they don't shove their packets into a specialised genital opening on the female's body. Or even on the side of her body near her eggs. They stick the capsules anywhere and everywhere.

These scattered spermatophores then burrow into the female's body. The story of how researchers unravelled the mechanics of this love act is rather memorable. Dutch scientists aboard the research vessel *Dorada* of the Falkland Islands Government Fisheries Department discovered the secrets of deep squid sex[4] by sticking a live male's sperm capsules on to the body of a dead male. It is noteworthy that no female squid took part in this act of scientific sexual investigation. Here is the unsettling account straight from their 2007 paper from the scientific journal *The Biological Bulletin*:

> The everting ejaculatory apparatus has the first contact with the tissue and may facilitate adhesion or the first penetration into the tissue, perhaps by mechanical means. After eversion, the cement body is exposed and may dissolve (perhaps with the aid of proteolytic enzymes) the host tissue to allow further penetration of the spermatangium.

Translation: the sperm capsules appear to be coated in