FREE WILL? …
IT'S UNAVOIDABLE!

Reg Morrison

Human behaviour is widely believed to be essentially rational and therefore fundamentally distinct from the behaviour of all other animals. This leads automatically to a belief system that is best described as 'anthropocentric'.

> ***Anthropocentrism****:*
> *(1) Viewing the world in terms of human experience and values. (2) The belief that our species is the star that crowns an evolutionary Christmas tree of life. (3) The belief that humans are the pivot upon which our divinely ordained universe turns.*

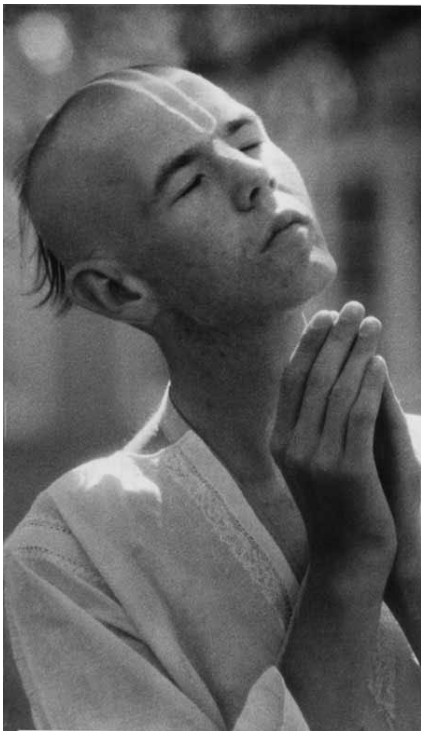
According to each of these anthropocentric visions our species is the only one that is fully self-aware and capable of rational behaviour and conscious 'free will'.

During the past hundred years however, another view has begun to take root. It proposes no fundamental distinctions for our species and maintains that we are simply one of a multitude of genetic expressions that constitute the vast and varied biota of this fertile planet. The label that is most commonly bandied about in reference to this non-anthropocentric proposition is 'Darwinism'. Its permutations range from minimal to extreme, but all are founded on the globally overwhelming evidence of evolution, both genetic and Darwinian ('survival of the fittest').

Charles Darwin's original proposition that humans evolved from the ape family now offends only religious fundamentalists and the uneducated. And yet the obvious corollary that humans are consequently shaped and driven by their particular brand of primate genes still seems to offend almost everybody. People accept that the genes are the sole driving force for animals because animals are just that, 'mere animals.' By contrast, they say, we humans are unique in that we possess both a spiritual factor and an intellectual capacity that are separate and independent of our physical body. Each of us therefore enjoys a mind-body 'duality' that separates us from all other animals. There is even consensus across all cultures that this independence of 'mind' bestows a unique sense of self-awareness and the ability to tailor our behaviour to fit the dictates of reason and override 'the baser instincts' of our animal heritage. In short: we are rational and have free will.

This curious perception, that each of us exists as two separate entities, one physical and the other spiritual, appears to have attended our species throughout its recorded history. It has been the Gordian knot of all philosophy from Aristotle onwards, and continues to provide humanity with most of its triumphs and tragedies and all of its moral dilemmas. In other words, the double image of ourselves that we see in the mirror of the mind is the source of both our pleasure and our grief. 'Spirituality' shapes our feelings of affection, admiration, compassion, joy and hope, and weaves into our culture the glittering threads of passion that enliven our literature, music, dance, drama and the graphic arts. And this double image, this body-mind duality, also represents the source of most human misery, causing us to succumb to the general belief that we are 'morally accountable' for our misdeeds.

Most of us expect both 'moral' and rational perfection from ourselves and from others. Human frailty irritates us. Failure to meet 'moral' or 'common-sense' expectations is invariably seen as a sign of intellectual handicap, a lack of 'moral fibre', or a deliberate expression of 'evil'.



LEFT: *A Hari Krishna devotee prays to his cult's particular divinity.*
RIGHT: *A future High Court judge, arrested at a demonstration for Aboriginal rights.*

In similar vein, the brain is often spoken of as though it were an architect-designed, fully integrated unit, rather like a computer—but one generally driven by novices and idiots. The human brain in reality is more like an old farmhouse, a crude patchwork of lean-tos and other extensions that conceal entirely the ancient amphibian-reptilian toolshed at its core. That it works at all should be cause for wonderment. As for pointing to our mental failures with scorn or dismay, we might as well profess disappointment with the mechanics of gravity or the laws of thermodynamics. In other words the degree of disillusionment we feel in response to any particular human behaviour is the precise measure of our ignorance of its evolutionary and genetic origins.

In a private note to himself Charles Darwin wrote:

'*Thought, however unintelligible it may be, seems as much function of organ, as bile of liver. This view should teach one profound humility, one deserves no credit for anything. [N]or ought one to blame others*.'

Unfortunately, this concept seems to be as unacceptable now as it was when Darwin first penned it in one of his notebooks in the 1870's. (He wisely refrained from pursuing the point in his published works.)

In the introduction to his book The Blind Watchmaker the distinguished British evolutionist Richard Dawkins was moved to complain: "It is almost as if the human brain were specifically designed to misunderstand Darwinism, and find it hard to believe." Our universal, and therefore genetic, need to see ourselves as separate from the rest of the animal world ensures that most of humanity will continue to be at least suspicious, if not thoroughly antagonistic, to Charles Darwin's heretical propositions. We prefer to believe that we alone are not 'normal' animals in that we are not genetically driven, but are essentially rational.

Yet we share the planet with some 20 to 100 million other species, all of them genetically driven. One would think that only a deranged gambler would be fool enough to bet on the presence of a solitary exception in such a vast biota. In other words, anthropocentrism hinges on an extraordinary proposition, one that demands extraordinary proof. Unfortunately, none exists.

Not the slightest scrap of hard evidence, either morphological or genetic, suggests that *Homo sapiens* is not, like all animals, a natural by-product of genetic and Darwinian evolution. We

should therefore assume that we, like they, are uncontaminated by any supra-natural influences. We may well be excellent communicators and tool-makers, and also the most self-aware, mystical and malicious animals on Earth, but overwhelming evidence shows that all these distinctions are of degree, not of kind. And yet the myth lives on.

Is it not strange that our genetic make up should allow, perhaps even prescribe, such naiveté? I would argue, however, that our peculiar genetic heritage purposefully blinds us to this reality in order to make us malleable and compliant to its demands, and that our habit of assigning ourselves an imaginary 'specialness', is the very mechanism that makes us willing servants of our genes.

Genetic material survives and proliferates solely because it is able to replicate itself and yield protein via partial replication. In other words replication is the only thing that genetic material does, and genetic material is the only molecular structure that can manage this astonishing trick on a regular, repeatable basis. It is this trick alone that enables genes to persist through geological time, outlasting the rise and fall of mountains and the drift of continents. Fragile as snowflakes in a physical sense, genes are the biological rocks upon which all life depends.

Our DNA incorporates 500 million-year-old worm genes. The bacterial genes that drive our mitochondria are more than two billion years old, and we have bacterial relicts living in our eyes that evolved shortly after the dawn of life, so some of the genes that drive them are more than 3.5 billion years old.

Genetic material is also uniquely able to accommodate slight variations in its molecular sequence and yet still negotiate the flexible obstacle course presented by an unstable environment. Sometimes those variants are even more successful at negotiating the obstacle course than was the parental code, and since these successful variants tend to leave more progeny, they engender the ratchet-like process known as Darwinian evolution.

Reproduction, behaviour and evolution: no other molecule can perform those three miraculous and crucial functions. This is the ultimate guarantee that genetic material is the sole driver of this planet's biota.

Genetic replication leading to reproduction and evolution are now widely accepted. Yet despite spectacular evidence that genes are able to specify astonishingly complex behaviour in the animal world, few people are willing to concede that their behaviour is essentially gene-driven and therefore not entirely 'rational'. Question this and you question their 'humanity'.

Tool-use was once commonly touted as a prime example of 'human behaviour'—until it was recognised that many other species used tools of some kind, and a few species even manufactured them to some extent. Tool use has now been documented in several mammals and birds, and even in arthropods. In fact, Australia's Net-casting spiders (Dinopidae) are second only to humans in their ability to manufacture and manipulate the complex hunting nets that they throw over their prey 'by hand. More significant still is the fact that none of their highly sophisticated technology is 'learned', since the juveniles leave their birthplace within a day or so and never see their mother knit her weapon from three different kinds of silk. Clearly, this technology and all of its associated behaviour is specified in the spider's DNA and is communicated from generation to generation solely via the transfer of genetic material that occurs during mating.

Nevertheless, the most remarkable moment of the whole tool-making process occurs when the construction phase is complete. During construction the small rectangular hunting net is secured in a vertical plane and under slight tension from a minimal array of support lines. When the knitting is finished and the net is complete however, the spider bites through the two vertical suspension lines only, thereby collapsing the net into a collection of loose horizontal folds. This crucial act of deconstruction effectively 'arms' the weapon, making it semi-mobile. It took humans more than two million years to approach this level of technological competence. These spiders do it without 'thinking', several times a night.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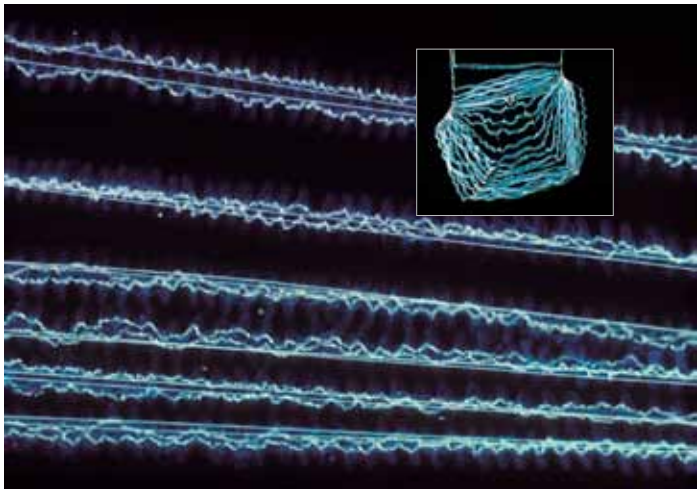
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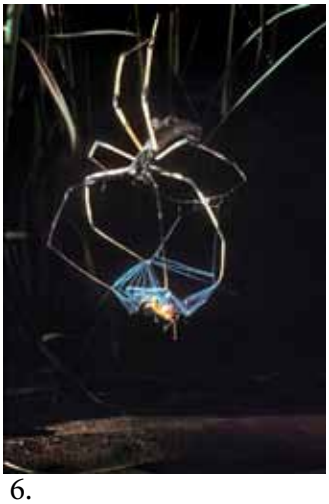
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1-2 A Dinopis subrufa *female 'knits' her complex hunting net with her hind feet.*
3. Detail: The three-layered, five-component hunting net.
4. A Dinopis subrufa *female waits for prey to pass beneath her.*
5. A Dinopis bicornis *begins her lunge at an unsuspecting meat ant as it crosses the carefully selected target area.*
6. The attack is lightning fast and is very rarely unsuccessful.


7. *With the meat ant securely entangled in her net, a Dinopis subrufa closes in for the* kill.

Our Un-selfish genes!
When mounting evidence of 'animal technology' finally made it obvious that tool-use, and even tool manufacture, could no longer stand up as definitive traits for our species, the standard fall-back position became 'altruism'—unselfish, cooperative behaviour performed 'in spite of our selfish genes'!

But the facts once again fail to bear out even this last line of argument. Animals too, are altruistic—just as altruistic as we are in most instances.

Having evolved as a cooperative species it seems that *Homo sapiens* retained almost all of those mammalian characteristics we most admire—selfless devotion, compassion, courage, generosity and wit—to the point where one of the truly remarkable things about human beings is not how 'bad' we can be, but how 'good' most of us are, most of the time—even by animal standards.

Unfortunately we take this cooperative 'goodness' for granted and commonly expect it. When it crosses the threshold into 'courage' and 'heroic self-sacrifice', however, we assume such extreme altruism to be uniquely human, an expression of human 'spirituality' and 'goodness' at its very best.

In fact, of course, such complex behaviour is common throughout the animal world, and in other species seems to be entirely free of tedious sermonising and self-congratulation. They, like us, simply do what works best for their genetic line. To this end many species mate for life, feed, protect, and educate their offspring with obsessive fervour, and willingly lay their lives on the line whenever family, tribe or territory is threatened.

A wild female wagtail once allowed me, an alien monster, to climb its tree and gently stroke its head as it sat on its nest, quivering with fear, yet resolutely protecting its unborn young. This, surely, was reckless courage on the scale shown by those men who threw their bodies over their wives and children to protect them from the bullets of a deranged gunman at Port Arthur, Tasmania, in 1996. No acts could be more explicitly genetic! Uniquely human? Rubbish!

The attribution of human motives and emotions to animals used to be considered sloppy science. The underlying fear was that such thinking might erode some of the respect that we felt we were owed as a uniquely sentient and rational species.

That particular academic taboo is less rigidly observed these days, yet in a perverse sense it remains entirely sound. Indeed, no animal displays human behaviour. Quite the reverse. Humans display only animal behaviour. Watch the action with an open mind and with our cultural sound track switched off, and this truth becomes blindingly obvious.

I once watched a male Australian magpie (Gymnorhina tibicen) play with its child by clasping it beak to beak and foot to foot, and then rolling with it down a small grassy slope in our front garden. When they reached the bottom (a couple of rolls) they separated, walked to the top of the slope and repeated the game. The nature of the game and its 'fun' seemed to be mutually understood.

While watching a small flock of Long-billed Corellas (Cacatua tenuirostris) returning to their customary roost trees on Kangaroo Island, South Australia, one windy afternoon, I noticed two or three individuals lean forward and take a firm hold of their branch with their strong beaks; they then spread their wings and let go with their feet. This enabled them to 'glide' effortlessly in situ, held to the tree only by their hooked beaks. It was clearly play behaviour, a 'look Mum, no hands!' stunt that they each repeated two or three times, squawking with excitement.
See next page ...

With wings spread and feet dangling a corella enjoys a 'free' ride on the wind. The second bird is getting a grip on its branch before performing the same stunt.

Sensory snapshots

I have spent many hours watching animal behaviour from a photographic 'hide', but regardless of whether my presence was obvious or unknown to the target animal, all species appeared to assess their environment via a series of multi-sense 'snapshots'. The more 'intelligent' the animal, the more snapshots per second and the more varied the spectrum of responses available to them.

Most animals appear to 'read' their snapshots in related sequences, but separately—much as we browse through the images in a photo album. Their responses appear to be similarly discrete and tailored to the separate sensory images as they arrive in the animal's brain. These sensory snapshots appear to be checked against a series of response templates that are prescribed by the animal's genome. Should an incoming snapshot fit one of these genetically determined

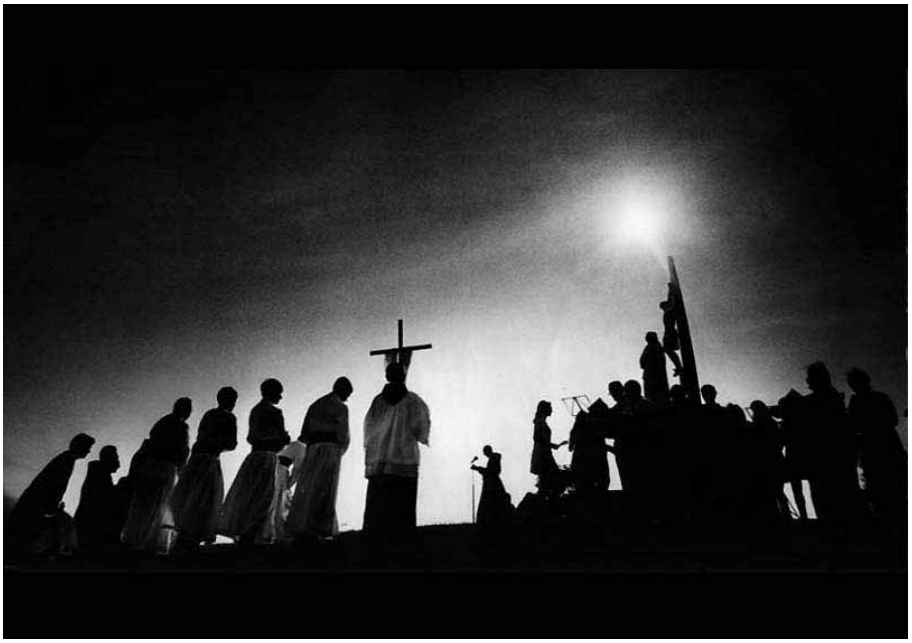
templates, a behavioural button is pushed and an appropriate genetic response is triggered. This clearly applies to one of my favourite animals, the Net-casting Spider and I have seen nothing in other species to discredit that general assessment.

The volume of incoming data and the speed with which we process it are the two factors that most distinguish our species. Just as the retinal phenomenon known as 'persistence-of-vision' smooths out the small discords between successive frames in an action sequence on a cinema screen, so our brains merge the torrent of incoming sensory snapshots into the continuous movie we call consciousness. Just as a model T Ford and a supercharged Formula One are both 'cars', it is only my linked complex of sensory assessors and massive neuronal filing system that separates my thought processes from those of the net-casting spiders that hunt in my garden every night. Our neurons are the same size and we even use the same neurotransmitters (e.g. serotonin, dopamine, acetylcholine, and an inhibitor, gamma amino butyric acid) to fire neural networks into action. The essential difference lies in the size and power of the two systems.

However, the basic similarity of the two systems becomes concealed from us when our genetic assessments and behavioural decisions are relayed from the basement of the brain to the shiny new cortical penthouse 'upstairs'. Here, in the left-brain's propaganda department, the anthropocentric editors take over, cutting, pasting, and 'correcting' the genetic message, and occasionally plugging gaps by pasting in snippets from old memory files. Our neuronal copywriters can't stand gaps in the storyline, any more than they can stand sensory 'silence'.

As a young newspaper reporter I was constantly amazed by the range of discordant evidence offered by first-hand witnesses during court cases, even among eye-witnesses with no axe to grind. It was clear that perceptions and memories were grossly unreliable as guides to factual events. When my own edited assessment of reality is finally passed to the 'copywriter' neurons in my Broca's Area, they rush to assemble a cohesive, 'rational' communiqué that might withstand both personal and public scrutiny if called upon. Meanwhile any discords between my incoming data and my final 'PR release' are swiftly 'forgotten'. I can't help it; this how human brains work.

Discord is inevitable between the mass of raw, incoming data (a right-brain artefact) and our propagandised, left-brain assessment of it. It not only generates our perceived 'duality', it also generates our 'spirituality' and anthropocentrism. We absolutely 'know' there is something else going on, both inside us and all around, but we can't lay a cortical finger on it, so we tend to say: 'Aha! It's supernatural!' Enter: gods, angels, devils, witches, aliens, market forces, lady luck, the fickle finger of fate, or that good old standby, 'our stars'.



LEFT: *A religious ritual in Sydney, NSW, based on a 2,000-year-old Middle East crucifixion.*
RIGHT: *A spiritualist 're-lives' the death of a murder victim during a séance in Perth, WA.*

This useful capacity for endless self-delusion has a most intriguing origin. Founded as it is on the loose patchwork of neuronal structures that make up the human brain, it boasts an evolutionary history that goes back more than 65 million years …

Perils of a double life

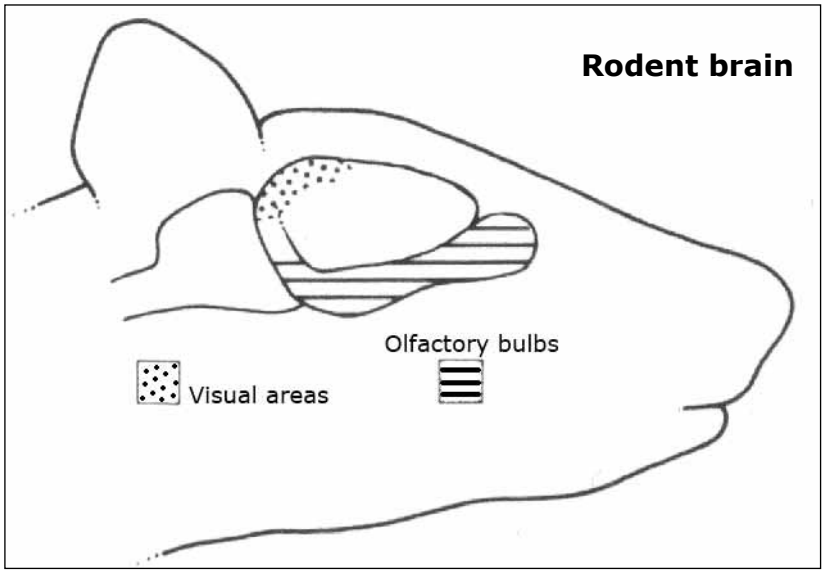
All mammals exist on two levels. Not only do they inhabit a physical environment comprised of air, water, earth, and other life forms that they can see, touch and taste, they also inhabit an invisible landscape made up of smells, sounds, heat, and electromagnetic radiation of various wavelengths. All this is further underpinned by a complex pastiche of memories, fears, and expectations. It is primarily on the basis of this vast raft of largely intangible factors that they make the most important decisions of their lives—when and where to find food, or a mate, when to stand and fight for their territory, and when to run for their lives.

We too inhabit both of those complex worlds, one tangible and visible, and the other invisible and abstract. And as with other mammals, it is the invisible world that dictates most of our behavior, communicating with our instincts as directly and urgently as the odour trails in my unweeded garden communicate with my resident bandicoot. Prevailed upon by my informational 'nose', I too, make choices I cannot help making, given the prevailing landscape of information, seen and unseen, tangible and intangible. It also means that regardless of the careful reasoning I may marshal in support of my actions, the choices I ultimately make are animal choices. In fact, the only thing that truly distinguishes us humans in the arena of animal behaviour is our naive belief that our decision-making processes are primarily cortical and rational, and therefore unlike those of all other animals.

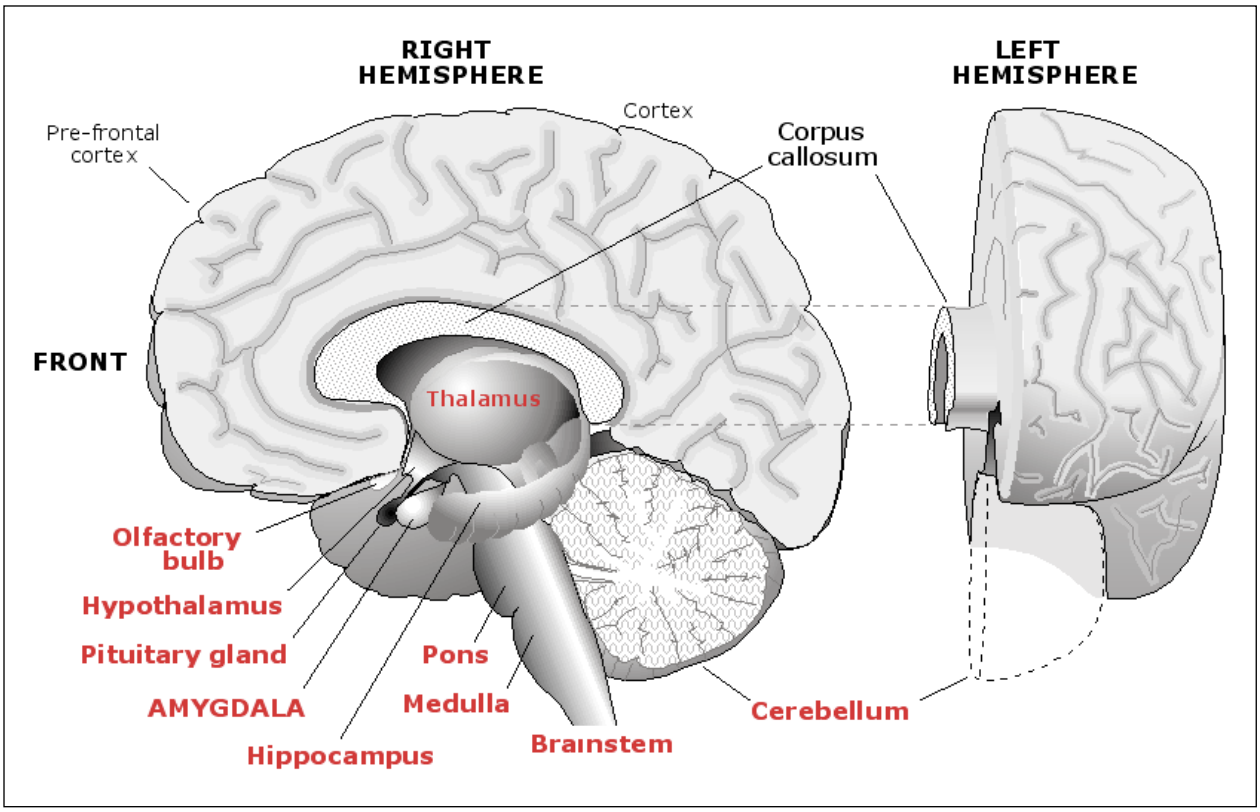
Central to the human forebrain is a region known as the prefrontal cortex. Current research suggests that this area is solely responsible for executive functions such as strategic planning and the allocation of cognitive resources. It allows us to juggle several ideas at once, comparing, discarding, selecting, and collating them to provide a reasonably rational decision-making system. In effect, we deal with intellectual information and abstract ideas much as our shrewish ancestors would have dealt with olfactory information.

Remarkably, there is now evidence to suggest that our massive forebrain evolved from the highly specialized, highly developed olfactory bulbs of shrew-like ancestral mammals. It may well have been this rich neuronal heritage that sent our evolutionary ancestor, H. erectus, on its meteoric trajectory to the top of the world's food chains. Australia's marsupial equivalent of shrews, the Long-nosed Bandicoot (*Perameles nasuta*), shown below, entirely depends on its sophisticated olfactory equipment to find its subterranean prey.

Of Mice and Men



As in shrews, the highly sophisticated olfactory bulbs in a rat's brain constitute a major percentage of the total brain mass, and there is now some evidence that this is the region of the brain that eventually evolved into the cortical mass that now constitutes the human forebrain.



Human brain (The ancient reptile-amphibian core structures are labelled in red.)

It delights me to think that all of the overlying cortical brain mass might rest, in an evolutionary sense, upon olfactory equipment that still makes an appearance in my garden every evening in the shape of Perameles nasuta, Australia's Long-nosed Bandicoot. As my bandicoot friend rummages through my unkempt garden, sniffing out its tasty subterranean prey, and sorting out the tangle of odours and pheromones that invest its territory afresh each day, so my prefrontal cortex continually rummages through tangles of intellectual and abstract data, sifting out the 'juicy' bits, 'tasting', sorting, and reacting to them as best it can.

Our shrewish ancestors were doing much the same things among the dinosaur droppings when the comet hit 65 million years ago. Thanks to their sharp wits and highly developed sense of smell they survived the global carnage of that time and lived on to give rise to a multitude of mammalian descendants. Plumped up and squeezed into a new shape, the shrewish olfactory lobes have become our neuronal Swiss-Army-knife, the all-purpose mental tool that enables us to devise the complex social structures and technologies that characterise modern civilisation.

We unwittingly commemorate the evolutionary link between intellect and smell every time we trot out the olfactory metaphors that stud modern human language. A proposition stinks; we get wind of a plan; follow the scent of an idea, get a whiff of scandal, smell a rat, develop a nose for news, and sniff out a good story. In fact, if it were not for this evolutionary link and the consequent operational similarity between mammalian odor analysis and the sorting of abstract data by the prefrontal cortex of the human forebrain, such references would appear to give a strange emphasis to a sense that no longer plays a major role in the daily survival of our species.

'Genetic determinism'

The standard argument against the proposition that genes are the sole determinants of human behaviour is built around the traditional axiom that such 'genetic determinism' would produce only servile robots.

In fact of course, precisely the opposite is true. Our well-concealed board of genetic directors is the solitary, gleaming Excalibur that evolution left lying on the floor of our empty armoury some two million years ago. Bereft as our ancestors were of fur, claws and fighting teeth this weapon was the only thing that stood between them and extinction on the dusty, dangerous plains of east Africa. They were still entirely gene-driven, but brain expansion had bequeathed to them a much broader spectrum of behavioural responses than was available to any other animal. Here was the most formidable animal ever to walk the Earth.

The fact that all our primary behavioural decisions are made in secret by a wholly unique parliament of genes still constitutes our Excalibur. It is evolution's guarantee that our behaviour remains rigidly mammalian in a general sense, and yet unique in a particular sense—and this ensures that we are neither fully 'readable' nor malleable. Here is the perfect recipe for indomitable individuality.

Four billion years of genetic and Darwinian evolution have been distilled into each human genome, and each is unique. There has never been a 'You' before, and never will there be again. In other words, it is your genes that make you unique, unreadable and 'free' in the only sense that really matters.

If, on the other hand, our rational cortex had indeed snatched the reins of behaviour from our genes between 50,000 and 100,000 years ago, as many so-called experts would argue, then circumstances and environment would precisely determine our behaviour and we would be easy prey for any passing tyrant.

As things stand, however, others know even less than I do about what is going on in the genetic depths of my unconscious brain. So potential tyrants be warned: you are at a serious disadvantage. The unique sequence of nucleotides in my DNA absolutely guarantees it.

NOTE

This text contains edited extracts from **The Spirit in the Gene** (New York: Cornell University Press, 1999). Republished in Sydney by Reed-New Holland in 2003, under the title **Plague Species: Is it in Our Genes?**