NIRVANA AND NEUROSCIENCE:
THE SELF-LIBERATING BRAIN

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As I write, thousands of athletes are converging on the city of Athens for the 2004 Olympic Games. They have all spent countless hours exploring, in both theory and practice, what it is to run, jump and throw[2], and what it takes to excel at their athletic discipline. Many of them will also know a good deal about when these activities go wrong: when swinging becomes falling, running becomes hobbling, and control crumbles into clumsiness. Indeed, you could argue that excellence at running is not possible, these days, without the best understanding of what running itself involves, and how it breaks down – as well as how it can be improved.

Buddhism says: not everyone can win a gold medal at the 1500 metres, but all of us have the potential to be excellent at life. And that potential to become an exemplary human being develops – as does running – from a blend of deep inquiry into what it is to be human, and how we fall short as persons; and skilful practice at different aspects of the art of living. Our ability to aim at buddhahood – that is, at exemplary personhood – depends upon having the best possible understanding of what it fundamentally means to be a 'person'. And on this subject, in the last few decades, the human and social sciences have made great strides. Science, for all its faults, fumbles its way towards reliable knowledge. Every scientist, however grand and respected, is always just one experiment short of having to rethink; and this humility is mirrored in Buddhism's fundamental commitment not to creed, but to painstaking, personal, first-hand enquiry. So the human sciencesa re worthy of our attention both for the methods they exemplify and for the insights they have accumulated.[3]

Of course, THE Buddha discovered some 'timeless verities' that most of us today still struggle to realise, or even to comprehend, in our own lives. But we also know much about human minds, bodies and societies that even Buddha himself would have had difficulty understanding. He had to make do with the cultural tools at his disposal, and much of the contemporary knowledge was extremely crude, often wrong, and inextricably interwoven with pre-scientific systems of supernatural belief. Now we can do better. The current psychology of perception is in many respects an improvement on the *abhidharma*. Theories of 'embodied cognition', pioneered by such transdisciplinary scholars as Francisco Varela, George Lakoff and Andy Clark, shed new light on doctrines like 'co-dependent origination' that have become, over the centuries, inflexible and abstruse, encrusted with layers of scholarship that the average Buddhist student today may gain little benefit from trying to unpick.

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[1] I am grateful to two anonymous referees, whose comments helped me to improve this chapter significantly.

[2] And dive and shoot and tumble and so on.

[3] 'Buddhas say emptiness is relinquishing opinions. Believers in emptiness are incurable.' Nagarjuna, translated by Stephen Batchelor, *Living with the Devil*, Riverhead: New York, 2004.

In this chapter, I shall start with a scientific perspective, and work my way back to spirit and soteriology, trying, as Einstein advised, to 'make everything as simple as possible – but not more so.' I shall ask what science can tell us about what it is to be a 'person'. What is it *essentially*; and how is that essence developed, distorted and overlaid through learning? And can science illuminate the processes of 'unlearning', or 'disidentification', through which any dysfunctional habits of mind can be reversed or transcended?

The four layers of personhood

> Tunes or pebbles, processes or substantial things? 'Tunes' answers Buddhism and modern science. 'Pebbles' say the classical philosophers of the West. Buddhism and modern science think of the world in terms of music. [But] the image that comes to mind when one reads the philosophers of the West is a figure in a Byzantine mosaic, rigid, symmetrical, made up of millions of little squares of some stony material and firmly cemented to the wall of a windowless basilica.
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> Aldous Huxley

Though science strives to do without pedantry, it cannot do without distinctions, and it helps, in understanding personhood, to talk on four different levels. These levels, fortuitously, correspond to four different senses of the word 'mind': senses which, as we shall see, have often been confused. The first is the functional level: what are persons up to? What is our fundamental design specification? Deep down, what matters to us? This 'motivational' aspect of persons corresponds to an everyday meaning of the word 'mind' which often gets ignored in learned discourse. Mind can be a verb which means 'to care'. What we mind about is what we care about. 'Never mind' means 'don't care so much'. A child minder is someone who takes care of the child.

In the context of a discussion of Buddhism, acknowledging that 'care' sits at the very heart of personhood is important. Though the cultivation of 'equanimity', for example, is a core Buddhist intention, this cannot be taken to mean that we should learn 'to care equally' about everything, for a creature without built-in attachments and aversions – needs, desires, threats and preferences – would not survive for a minute. *That* we care is not the problem: it is *what* we care about, and *how* we respond when things are not going our way, that needs care-ful attention. I once heard a young self-professed Buddhist (on New Zealand radio) say that Buddhism, for him, meant not minding when someone died. If that is Buddhism, I thought, he can keep it. A life without feeling, including sorrow, holds no appeal for me: it is lower and deader, not higher and more alive. And science concurs. We are inherently creatures with cares, passions and desires, and to attempt to attenuate or extinguish them *en bloc* is not enlightened but perverse. Asceticism as a life-style is a form of self-harm, just as much as burning yourself with cigarettes.[4] It is not passion that is the problem; it is the ways in which passion become curdled and coagulated in our systems. The human sciences can help us understand the motivational and emotional side of persons.

The second level at which science has developed our understanding of personhood concerns *how* we think and learn and act 'intelligently'. Intelligence, from a biological point of view, is what enables us effectively to mesh our goals and desires with the capacities we have for action, and with our sense of opportunity or occasion. As we grow, so we become highly skilled at knowing when and how to act. In learning the ways of our families and friends, and

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[4] Asceticism as a temporary practice, a form of spiritual exercise or corrective therapy, is of course a different matter. When you have a bad back, sleeping on a board for a week may be beneficial. Deciding that a hard bed is good for your soul is simply masochistic. (Or, as Buddhists say, when you have crossed the river, it is smart to leave the boat behind.) One of the reasons why people deliberately cause themselves pain and injury is precisely because they want to escape from that kind of unbearable 'equanimity' that clinicians call 'flattening of affect'.

our culture, we acquire the tools and sensitivities that comprise our 'skilful means'. And this part-inherited, part-acquired 'organ of intelligence' is the second common usage of the word 'mind'. As a noun, 'the mind' is what makes us smart. People commonly use the word to refer to someone who has a 'good mind', and is thought to be knowledgeable and clever. She can figure out complicated things, make good decisions, interact appropriately and provide articulate justifications and explanations.[5] Intelligent people can 'make their minds up' and 'speak their minds'. Understanding exactly what that organ of intelligence is – where it lives, what it comprises, and how it works - is precisely what cognitive neuroscience is about.

Thirdly, there is the level of personhood that comprises our conscious experience, our lived reality. And the word 'mind' is often used to refer to consciousness, awareness or attention. To 'bear something in mind' is to keep it in consciousness; to keep it active and 'alive'. 'Mind your step!' is a call to awareness. To be 'absent-minded' is to lose awareness and slip onto 'automatic pilot' without noticing. To turn something over in your mind is to think about it consciously. To understand persons, we have to attend to all the many facets of our consciousness: perceptions and sensations of which we are aware; images and memories and thoughts that flit across our minds while awake, and the dreams and fantasies that occupy us while asleep; moods and feelings; and those more indistinct creatures that lurk on the margins of consciousness that we call hunches, inklings, glimmerings and intuitions. This is the level at which we 'know ourselves': where we concoct stories about our lives and personalities, our cherished beliefs and our darkest fears. As we shall see, these stories may or may not correspond to the what actually drives us at the two previous levels.

Finally, there are the 'supra-personal' layers of personhood: all the ways in which 'identity' refused to be confined within one isolated bag of skin. When we say the British people are of 'two minds' about whether to sign up to the Euro as their national currency, or that the board of a company 'is minded' to sell off one of its subsidiaries, we are acknowledging that persons are continually enmeshed within and constituted by wider systems: ecological, technological, social and cultural. My liver only has the shape and function that it does because it is part of a living body, and in intimate and continuous interaction with all of its many functions. Cut it out and it immediately begins to change, lose definition and eventually to stop working. Just so, I have the shape and thoughts and feelings that I do only by virtue of my constant interaction with the wider 'bodies' of nature and society. My personhood is fundamentally relational. The 'altered state of consciousness' of the prisoner in solitary confinement, or the hermit, is no more real, no nearer to the plain unvarnished truth of 'me' than was their social self. Indeed, in many ways, for a member of an indelibly social species, it may even be further away. Science shows (without any undue rhetoric or supernatural metaphysics) that the attempt to confine personhood to one mobile pillar of complicated biological tissue is at best a crude approximation to the truth – and commonly a self-defeating misconception.

Having one word that refers to all of these four levels does not mean that they are the same. You do not try to 'deposit money' at the 'side of a river' or in a 'wall of cloud', though the word 'bank' refers to them all. And it is an open question – one in which cognitive scientists are very interested – as to how these four layers of personhood relate to each other. Some commonsense assumptions – so familiar as to be 'second nature' – are coming to look, under the careful scrutiny of science, increasingly dubious. Is 'mind' in the sense of the organ of intelligence the same as, or closely allied with, 'mind' in the sense of conscious experience? Descartes thought that the 'organ of intelligence' was precisely the well-lit front-office of consciousness, and he taught us that the idea of 'unconscious intelligence' was a nonsense. Where Shakespeare could have one of his characters, Achilles, say 'My mind is troubled, like a fountain stirr'd; And I myself see not the bottom of it' (*Troilus and Cressida*, III,3), Descartes, only thirty years later, was busy severing his conscious 'mind' completely from its dark mysterious roots, and denying the latter's very existence. Contemporary cognitive science is giving us good grounds for reversing this mistake. Scientists now agree that much

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[5] If the use of the female pronoun surprises, that may just go to show what a stereotypically male view of the mind *qua* 'organ of intelligence' we have been socialised into.

of our intelligent activity actually goes on outside of consciousness, and that the contents of consciousness are more partial, intermittent and often dubious, than we think.

Confusion is also caused when the first two senses of 'mind' are disconnected, and the idea of 'intelligence' is deprived of its rootedness in care and its intimate relationship to emotion, and is reduced merely to a kind of bloodless intellectual rationality. If the apotheosis of human development is seen as the cardinal or the professor, there are a great many people – and not only women – who prefer to look elsewhere for inspiration. And neuroscience agrees that it is not smart at all to see disembodied, disembedded rationality as the pinnacle of human intelligence. On the contrary, neurologist Antonio Damasio has shown that the disconnection of care and comprehension that follows certain kinds of damage to the frontal lobes of the brain is highly dysfunctional. Such patients can understand and explain complicated situations perfectly well – but they act in ways that are foolish and self-defeating, as if their rational intelligence had lost traction in the real world.[6] Psychiatrist Louis Sass has argued convincingly that certain symptoms commonly associated with schizophrenia can arise because the disembodied, Cartesian form of intelligence has been developed too much.[7]

It also seems to be a mistake to ignore the supra-personal levels of personhood, and to try to confine the 'organ of intelligence' within a single envelope of skin. As my liver is to my body, so I am to the wider ecological, technological and social systems of which I am part. Take me out of my familiar ruts, routines and roles, and set me down on a Sardinian beach or in a Thai monastery and I am no longer the same 'me'. At a reunion of old college friends my partner is shocked at how I metamorphose before her eyes into someone with a different sense of humour, different apparent values, even a different accent, from those she thought were 'the real me'. I am so interwoven with and dependent on my laptop these days, that there is really no difference in kind, and even very little in degree, between the crashing of my hard disk and a mini-stroke. Body-ware upgrades, such as fashionable clothing or contact lenses, and mind-ware upgrades such as cell phones and personal organisers, are so plentiful these days that 'the real person' can only be seen in the context of, and as constituted by, the 'extended brain' that surrounds them.[8] It makes no more sense to try to hunt for someone's essence by stripping their friends and resources away than it does to deprive David Beckham of his ball, his boots and his team-mates, and say '*Now* show me how great a footballer you are.' As Alan Watts used to say, the whirlpool dies if you try to take it home in a bucket; and so do we.[9]

For much of human history, it has seemed to people that they also needed to add a fifth layer to their understanding of personhood: an explicitly *spiritual* layer that mediated between the person and a supernatural realm of gods, spirits and occult forces. With their limited understanding of biological systems – what they were, and what they were capable of – it appeared impossible to account for some aspects of personhood on the basis of the mind-body complex alone. How could bodies be spontaneously alive and active? Surely some animating spirit was needed to breathe life into what in the graveyard looked like very dead matter indeed. And where did this spirit go after death? Surely 'it', whatever it was, could not just be snuffed out, but could animate another body. Where did unexpected bursts of courage or strength come from, or sudden insights and inspirations: without any sense of internal anticipation or control, surely they must be inspired from without. What about unreasonable, inexplicable or downright self-destructive impulses? Surely I could not have been responsible for such blatant or perverse stupidity, but must have been high-jacked – 'possessed' - by some malign force? When the voices I hear are so real, surely I cannot have made them up myself. And when I am – again unexpectedly – calm and wise, when I react with kindness and

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[6] Antonio Damasio, *The Feeling of What Happens*, William Heinemann: London, 1999.

[7] Louis Sass, *The Paradoxes of Delusion*, Cornell University Press: Ithaca, NY, 1994.

[8] Thanks to Andy Clark in *Natural Born Cyborgs* (Oxford University Press: Oxford, 2003) for some of these vivid examples and turns-of-phrase.

[9] Alan Watts, *The Wisdom of Insecurity*, Rider: London, 1974.

understanding to the man who has just spat on me in apoplectic rage: where can that goodness have come from, if not from the divine? When you get down to it, how could meat possibly 'think': the very idea is preposterous.

For a whole variety of reasons, it has seemed obvious that there had to be some kind of immaterial 'soul' to fill the explanatory gaps, and mediate between 'me' and the transcendent forces that animated and impelled me. It was inconceivable that 'mind' in all its wonderful waywardness could just arise out of 'body'. To many, it seemed as if mind must function as a kind of personal satellite dish that was picking up the divine (or malign) broadcasts. No wonder that some kind of slippery soul-substance is found so often in different cultures, including Buddhist ones, or that it has proved so resistant to debunking. Though the doctrine of *anatta* is canonical in Buddhism, and Buddhists agree that there is no self-existing 'self', nevertheless for many there remains a subtle something that survives the death of the psychophysical body-mind system, and enables the doctrine of rebirth to survive.

However, as science has discovered more and more about the first four layers of personhood and their intricate interrelationships, and has started to clear up some of the earlier confusions and misunderstandings, so more and more of the erstwhile functions of the 'soul' have been accounted for. We know how 'life' appears as an emergent property of living systems, and we are beginning to understand how neuronal systems as complex as the mammalian brain could generate consciousness by themselves – though more of that later. Is it then possible that even the more unusual and outré facets of personhood – including, most importantly, the spiritual – could also arise from the intelligent eco-bio-social system that we are, without the assistance of any hypothetical supernatural forces or entities? Could science eventually offer an explanation for enlightenment: an account of how the human system can get itself in a tangle, and then, under the right conditions, put itself straight again? Let us now look at these four layers in a little more detail, and see how far they will take us.

The sophistication of desire

The first layer of personhood, you recall, concerned what people care about: their motivational and emotional aspects. Science tells us that, unlike silicon-based systems – computers and so on - naturally-evolved carbon-based systems – animals - are bundles of desires. Like the simpler animals, we humans have a small set of in-built goals: to find periodic nourishment and a secure habitat; to mate, and protect our young for a while; to flee from or fend off the unwanted attentions of predators; to rest and recuperate; and so on. We need air, water, food and warmth; shelter and security. We are designed to associate with our fellows, and to have sex and raise children with some of them. We prefer certain environments, nutriments and companions to others. It is a core part of our fundamental design specification that we seek and avoid, protect and escape. Up to a point, 'attachment' and 'aversion' are in our blood.

One of our in-built priorities, it seems, is to take care of others. Just as animals that have stable homes are programmed to take care of their nests and burrows, so social animals, like human beings, have evolved to take care of their social as well as their physical milieu. Up to a point, the chances of my genes surviving and reproducing are linked to the fortunes of my relatives, and of the wider community that supports its members. But only up to a point: this impulse towards care is not over-riding. Sometimes the primate brain calculates that survival is better served by running off with the bunch of bananas than by sharing them, or by growling rather than smiling. But there are social costs of being selfish, and we know in our genes that cooperation pays dividends. Enlightened self-interest, embedded in our biology, makes us kind, generous and forgiving – at least sometimes.

Unless the demands on our own personal survival are very great, and our personal history has been badly skewed, the people we are especially kind to are our own children. They carry our genes, so this bias makes perfect evolutionary sense. And they repay the complement by inheriting, along with the DNA, a whole host of cultural habits as well. Children are born with the desire to join the social dance that surrounds them, and they are genetically equipped to do so. We know that their brains are designed to download and install the habits of speech,

judgement, action and reaction that characterise the cultural milieu in which they are immersed. (Just as a newly installed software upgrade requires you to close down and restart your computer, so children too need regular bouts of sleep to help them consolidate the massive amounts of learning they are doing.)[10]

And that means they start to overlay and extend their 'natural' in-built repertoire of desires with the additional goals, interests and phobias that are being modelled by their families and 'mind-ers'.[11] They learn to want what we want, to fear what we fear, to ignore what we ignore, to be disgusted or amused by whatever disgusts or amuses us. Wanting to be accepted and loved, they are eager to learn how to fulfil – and to *want* to fulfil - any conditions that may be placed on their 'lovability' - so they play nicely with the new baby when mother is around. But also, wanting the lion's share of parental attention, they may be unable to resist the temptation to kick the new cub out of the family den when no-one else is looking. Through this social learning, they acquire new sensitivities, vulnerabilities and interests, and as they do so, their repertoire of motives expands accordingly.

One could argue that Every new conditioned desire draws strength and importance from the basic, 'natural' desireS on which it is parasitic; and, of course, it brings with it, as its shadow, a new threat - that I may not get what I want, or, worse, what I believe I *need*. Thus, to the basic need for security, we add the desire for affection and friendship, and thus turn indifference or isolation into things to be feared – more unwelcome possibilities to be anticipated and neutralised. The basic need for sex and procreation is culturally encouraged, for many of us, to proliferate into a lifelong concern with appearance and 'being attractive', so that a liver spot or a wrinkle becomes transformed into an enemy.

This proliferation of priorities begins to cause management problems. As with a business meeting, long agendas need careful sequencing; rescheduling may be necessary as unexpected issues and conflicts emerge; and there always has to be room for 'any other business'. Glitches occur when two incompatible desires become active simultaneously. I want the last bit of cake but I don't want to look greedy; I want to be liked by my team but I want that promotion. I want to be kind, but I don't want to be late. I want to take your hand but I'm terrified of being rejected and looking a fool. I want to look young, and I want the leisure and self-acceptance that may come with age – so do I do my earnest, boring 20 minutes on the wretched treadmill in the spare room, or not?

The feeling mind

The second layer of personhood, 'mind' in the sense of the 'organ of intelligence', exists to cope with these desires and entanglements. Its job is to find effective ways of pursuing goals, satisfying interests, meeting needs and avoiding threats, and it does so by discovering ever more effective ways of integrating perceptual possibilities and action capabilities with the constantly changing mixture of motives. Intelligence exists to serve motivation. From a biological point of view, the ability to understand abstruse philosophical debates and score well on IQ tests comes very low down on the motivational scale.[12] Personhood is 99% visceral, embodied – and emotional. It is the mistake of the person over-identified with their intellect to suppose that intelligence and emotion are at odds, and that the latter is a subversive nuisance. We should not allow ourselves to be fooled by those who are out of touch with their own feelings into believing that separating thinking from feeling is a good, a 'higher', thing to do.

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[10] Though human brains are in many ways unlike computers, I hope I can get away with the occasional quick metaphor!

[11] See for example Michael Tomasello, *The Cultural Origins of Human Cognition*, Harvard University Press: Cambridge, MA, 1999.

[12] See for example Ken Richardson, *The Making of Intelligence*, Weidenfeld and Nicholson: London, 1999.

So-called ‘cognitive’ scientists used to make this mistake a good deal, restricting their interest in personhood to intellectual functions such as ‘memory capacity’ or abstract ‘problem-solving’. But not any more. Now many of them are busy putting body, motive and emotion back together again: synthesising them into a larger, more accurate picture of personhood. Emotions are not symptoms of malfunction; they are essential aspects of our all-round intelligence. Sure, they can go wrong, just as perception and memory can. But we have been given our emotions for a good reason - to help us live effectively – and it is not at all intelligent to make enemies of them. Here’s a rough sketch of the current way of thinking about the function of emotions.[13]

We, like our animal cousins, arrive bundled with a repertoire of ways of responding when our desires are not met, our plans thwarted, and our well-being threatened. When things stop going smoothly, our brains make lightning appraisals of what *kind* of threat or disruption is occurring, and activate the appropriate mind-sets and reactions. Attacked out in the open, we are instantly readied to flee, and our senses turn outward to catch a tell-tale glimpse of a hideaway, or the scent of fox. But threatened at ‘home’, or with our kids, we are primed not to run but to stand our ground and growl and fight. Trapped and alone, we cry out for help. Feeling sick, our system convulses and expels the invasive substance. Wounded, we hide and rest, and our senses turn inward. Faced with something strange but (provisionally judged to be) not dangerous, we tentatively prod and play and investigate, inviting it to reveal itself, and thus learn its ways and potentialities. Unable to make any quick diagnosis of these kinds, we freeze, attend, and seek to gather more information about the general situation. Overwhelmed, as a final resort, our action and perceptual systems may close down completely, leaving us paralysed and numb.

Each of these ‘states of readiness’ has a different conscious feel, and their distinctive subjective signatures are one aspect of what we call ‘emotions’. The feeling of flight is *fear*; of defence is *anger*; of isolated inadequacy is *distress*; of sickness is *disgust*; of learning is *attraction* and *interest*; of uncertainty is *anxiety*; of overwhelming danger or disruption is the passivity and numbness of *shock*. Just as we arrive with a basic portfolio of desires, so we have an emotional starter-kit of ways of dealing with disruption, frustration, danger and surprise. Emotions, in themselves, are never ‘destructive’. They are part and parcel of the organ of intelligence doing its intelligent best to keep us alive and well. To develop an aversion to one’s own fearfulness, or irritability, or sexual desire, makes as much sense as hating your own feet. Trying to run away from your feet is futile and frustrating – and so is trying to escape your own emotionality. (It is, of course, equally absurd to try to run *towards* your feet – or to try to ‘accept’ your own emotions.)

As our life agendas – our portfolios of wants and likes and aversions - become more complicated and entangled, so our emotional systems struggle to keep up. Evolution designed them to respond intermittently to particular kinds of threat. They fire us up, channel our body-minds to meet the emergency, and then stand down. But human societies, 2500 years ago almost as much as today (at least for ‘sophisticates’), weave such intricate tapestries of desire in the minds of their children that these old emotional systems start to mislead, break down or blow up. As Daniel Goleman said in *Emotional Intelligence*, a system that was designed to deal with tigers now gets triggered by a minor car or even a critical word from a boss.[14] And when incompatible desires are concurrently, even continually, active, there is no emotional stand-down to be had. Our organs of intelligence hunt endlessly, and fruitlessly, for resolutions that will not come, and we become chronically tense and tired. No wonder we yearn for the simplicity and clarity of which we are starved, and long for care-free weekends and holidays when we can simply walk, swim and *be*. (The retreat business is booming in the

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[13] What follows is a development of the kind of approach that one finds in, for example, Keith Oatley, *Best Laid Schemes: The Psychology of Emotions*, Cambridge University Press: New York, 1992.

[14] Daniel Goleman, *Emotional Intelligence*: Bloomsbury: London, 1996.

West partly, perhaps, because retreats offer – demand – a holiday from the complexities of desire.)

Perhaps the most pernicious group of emotion-twisting desires and threats are those that are conjured into being by the acquisition of a personal 'identity'. Other people start the ball rolling by attributing a variety of attributes to me – and then expecting me to live up to – and within – them. When they call me 'stupid' or 'clever', 'selfish' or 'attractive', they are telling me how they expect me to behave. And behaving 'out of character' often meets with a frosty reception. So I go along with it, and eventually I buy it. But worse is to follow, when I begin to get the idea that who I am – the core of my personhood – resides in the shadowy *subject* of all these *predicates*. Bombarded (in English) by phrases like 'I want', 'I am', 'I tried', 'I decided', 'I remembered', 'I will' and so on, it becomes impossibly hard not to succumb to the illusion that 'I' actually refers to something real, persisting and instigatory – located within my skin, and largely within my consciousness.

Through this insidious narrowing of self-reference, the sub-personal and the supra-personal levels of personhood begin to be eclipsed. I lose touch with my unconscious intelligence. I start to confuse consciousness with the organ of intelligence. It is not that the organ of intelligence *becomes* conscious, that I *lose* my unconscious virtuosity; it is simply that I withdraw my 'sense of self' from that region or level of mind. I learn to neglect or overlook it. And I also lose touch with the ecological, distributed, systemic dimensions of my being. Identity shrinks to include only my body (and sometimes not even that), my character, my thoughts, my possessions and the few select other people from whom I have not retracted my connecting bond of care. The line between Me and Other becomes drawn more strongly, and I promote and defend all and only those things that lie on 'my' side of the line. And I even learn to fight with myself, whenever I notice that the facts of my existence are at odds with the fallacious image of myself as the conscious, controlling character. Not only do I split myself off – in my mind, though not in reality – from the wider systems that constitute and sustain me; I also divide myself into different pieces, siding with different bits in turn against the other. 'Why shouldn't I have a bit of fun? I owe it to myself…' versus 'You selfish idiot; there you go again making yourself unlovable…When will you ever learn?' And so, endlessly, on.

The art of self-defence

In the face of all this, the organ of intelligence is never quiet. It has no stable resting place. There is always more to be gained, worried about, and protected against. So how is peace ever to be achieved? Commonly, the mind falls back on the deployment of the various well-documented psychological defences, principally denial or 'tactical inattention'.[15] Drugs will do it, for a while, though at an increasingly unsustainable cost. So will throwing yourself into 'flow' situations of challenge or danger, in which the inner whirlpool of worry has to be temporarily switched off, while the mental and neural resources which it normally requires are commandeered to meet the intense demands of a challenging situation. Fighting and some computer games achieve this, as do thrilling or violent spectacles that 'take you out of yourself': dogfights, or movies like *Kill Bill* or *The Matrix*. But these too provide only a holiday. 'High', as Ram Dass said, 'is where you come down from'.[16] And as you learn new skills, and habituate to intense stimuli, so the challenges may have to become ever more extreme in order to achieve the switching-out of self-consciousness. You are in danger of becoming a distraction-addict.

However, the brain's ability to tamper with its own internal machinery enables it to achieve tactical inattention without the use of drugs or external distractions. Of special relevance here is its amazing ability to inhibit its own activity. As the sense of self becomes more firmly located in consciousness, so 'I' can give my self some peace not by finding smart ways of resolving motivational tangles, but simply by preventing the awareness of them from

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[15] Daniel Goleman, *Vital Lies, Simple Truths: The Psychology of Self-Deception*, Simon and Schuster: New York, 1985.

[16] Ram Dass, *Be Here Now*, Hanuman Foundation: Boulder, CO, 1978.

becoming conscious. I can draw a veil over my own intransigent complexity by disrupting the neural conditions that would be necessary for consciousness. The trouble is, of course, that the complexity is not thereby resolved: the inner conflicts, as Freud well knew, persist outside self-awareness and threaten to break through in disguised form. And the further cost is dissociation: I become less transparent, more mysterious, to myself. The organ of intelligence itself becomes bewildered and even perverse: a paradoxical threat to my well-being, as well as being the resource with which I pursue my well-being.

But let me take a step back and explore just where this facility for self-deception comes from. Why does the brain possess this amazing ability to inhibit itself? Why did it develop its massive 'frontal lobes' whose functions largely concern inhibitory regulation of what is going on elsewhere. Inhibition may well have started at a behavioural level, when our ancestors discovered that aping other people overtly could 'give the game away'. Visible signs of our intentions – where we are looking for example - make it easier for others to read our minds, to infer what we are up to, and thus outwit us. By inhibiting the outward signs of mimicry and empathy, you can attempt to read someone else's mind without giving them access to your own, and this, so evolutionary psychologists surmise, conferred a heritable advantage in the escalatingly complex 'social arms race'.[17] The organ of intelligence, in other words, evolved to be fundamentally empathic as well as rational and emotional. From an early age we learn to make working mental models of the important other people around us, so we can both cooperate and compete with them more successfully.

From the scientific point of view, selfishness is not 'bad', nor compassion 'good' of themselves: each has its place. It is balance, rhythm and appropriateness that are at stake. And it is this 'balance of mind' that may well become disturbed when the computations of desire – what to pursue, what to sacrifice, what to defer, what to deny – become impossibly complex and demanding. For example, awareness of the long-term benefit – necessity even – of maintaining social goodwill may get attenuated, and then the anti-social behaviour of the mugger, the logger, the philanderer or the corporate raider becomes unrestrained. 'Bad' or even 'evil' people, in these terms, are simply those whose brains have been conditioned to select unfortunate ways of pseudo-resolving an impossible dilemma.[18] If kindness has not been modelled for you, so you may not have had the chance to learn its ways or witnessed its value. And if your own natural generosity is abused, your organ of intelligence may begin to make unbalanced computations of profit and loss, and to generate actions that deplete (rather than replenish and enrich) the vital reservoir of social goodwill that potentially buoys us all.

So inhibition itself is a mixed blessing. It is potentially a highly effective, multi-purpose tool for enhancing the quality of life. As well as concealing intentions from others (as well as from ourselves), for example, it allows external *exploration* to become internalised. We can set up investigations in the inner 'rehearsal studio' of imagination, rather than on a public stage, and this enables us to explore privately the possibilities that are latent in our internal models of the world, and of other people. I have never *seen* how you react when someone ignorant of established protocol takes your chair in the staffroom – but I can *imagine* (and if I am feeling charitable, warn the hapless student to move before you arrive). Neuroimaging studies of the brain show that during such mental rehearsal, the activity in the brain is only slightly less than when overt action is taking place – even though the commands to the muscles have been very much attenuated – and thus considerable learning can take place, albeit vicariously. Spiritual exercise designed to rehabilitate empathy and kindness, such as 'exchanging self with other' (when you imaginatively put yourself in someone else's shoes) rely on the same principle.

More generally, inhibition enables the brain to sharpen its own internal operations. The speed of a car becomes much more controllable when it has brakes, and the same kind of

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[17] See Nicholas Humphrey, *A History of the Mind*, Chatto and Windus: London, 1992.

[18] This does not, of course, mean that it is either morally wrong or practically ineffective to try to get their brains to compute in a different way by punishing them.

antagonistic tension between excitation and inhibition enables the activity of the brain to be channelled much more precisely, and to start and stop over much shorter time-scales. It has even been suggested recently that the frontal lobes' ability to modulate the level of inhibition is vital both to human reason and human creativity. Put simply, the 'natural' tendency of the brain is for excitation to flow from an active centre – corresponding to a word you have just heard, for example – towards its associates. When I hear 'cat', activity automatically spreads from the Cat centre towards the Dog and Fur and Pet centres (like ripples from a stone thrown into a pond). Without inhibition, all the different connotations of 'cat' are activated equally, and I don't know which ones are appropriate to current contexts and purposes. With inhibition, the context and purposes can highlight the most likely or relevant meanings by dampening down those that would look odd or implausible in this situation. Inhibition enables my brain to corral and direct its own activity, and thus to follow an extended train of thought without getting continually sidetracked. [19]

However it is precisely when the normal meanings and associations *don't* apply that we need creativity. We need to be able to look freshly, without preconceptions, and to allow those less likely patterns and connections – often in the shape of fruitful metaphors and analogies – to come to the surface. To do this, the frontal lobes have now to quieten down, *reducing* their inhibitory sharpening, and allowing the activity of different centres in the brain to bleed together, like watercolours on wet paper. To be more poetic, when inhibition is high, the brain functions like Venice, with well-defined canals. When it is low, it functions like a broad shallow river delta, in which all kinds of streams and tributaries can meander together and create unexpected patterns and currents. Thus chronic inhibition – overactivity in the frontal lobes – can keep us locked into more conventional, more stereotypical ways of thinking, feeling and acting, and we miss out on the novel, creative or humorous possibility. It is even possible that some kinds of meditation, if pursued too earnestly, and with a strongly pre-programmed view of what 'progress' and 'achievement' will look like, could lock the brain into this focused, restricted modus operandi (despite the fact that the practitioner *thinks* they are doing the best they can to find the way out of their motivational tangles).

As we saw earlier, neural inhibition can also underpin the phenomena of repression and dissociation. And here we have to draw into the conversation the third sense of the word mind: that of conscious experience. Much of what goes on in the brain is necessarily (and usefully) unconscious. We should be thankful that consciousness represents such a small fraction of all that is going on in us at any moment. If we were to privy to everything, we should surely be overwhelmed.[20] The mystery is not that we are unaware of so much, however; it is why and how we ever become conscious of what we do. Exploration of the 'why' must wait for another time. (Perhaps there is some relationship between consciousness and learning. What I am conscious of is what I am treating as the current object of inquiry. Unexpected things grab my attention, and they stay in the well-lit focus of attention till I see whether they are safe or not, or till I have found a way of working with them. Familiar things can be brought under the same kind of scrutiny when I am inspecting them for unrevealed possibilities or flaws)

We still don't know exactly *how* activities of the brain become conscious. It seems that there is no particular location in the brain that corresponds to consciousness: no place where the 'Cartesian theatre', as philosopher Daniel Dennett calls it, holds its shows. However, the *duration* of activity, wherever it is, does seem to determine whether neural events become conscious or not. Stimuli in the brain that last for less than approximately half a second can affect what is going on elsewhere – they send out their ripples - but they do not become conscious in their own right, unless they are very strong. In that case we might say that the

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[19] Colin Martindale, 'Creativity and connectionism', in S.M. Smith, T.B. Ward and R.A. Finke (eds), *The Creative Cognition Approach*, Bradford/MIT Press: Cambridge. MA, 1995.

[20] As some unfortunate people are by synaesthesia, for example, when every small event sets off an uncontrollable multisensory fireworks display of associations in consciousness. See AR Luria's classic *The Mind of a Mnemonist*, Penguin: Harmondsworth, 1966.

reverberations of a strong input, like those of a firmly-struck bell, last for the requisite amount of time, so it is still the duration that matters. But it also looks as if consciousness requires something more subtle: a transiently stable and coherent pattern of activity that links together different areas of the brain – perhaps widely distributed – and connects them with the currently dominant set of motives and intentions. This 'dynamic core' of activity, as Gerald Edelman and Giulio Tononi have called it, is built around that set of current values in which we are most invested, and in that sense, perhaps, corresponds to the shifting 'sense of self'.[21]

Thus the brain has a simple way in which it can render aspects of its own activity unconscious. It simply disconnects them from the dynamic core. If, for some reason, it decides that the stream of consciousness is flowing in a dangerous direction, the brain can use inhibition to throw up barriers and roadblocks, and so isolate that stream from the conscious core. Medieval maps used to have signs that simply said: 'This way be dragons', and the brain has its equivalents. Just as it can learn to dam a 'natural' flow of activation that has led in the past to a slap from Mummy, so it can learn to inhibit the special kinds of activity build-up that might lead to consciousness. If I have decided to define myself as 'calm and controlled', for example, incipient feelings of panic can be dampened or disconnected so that they do not appear on the screen of consciousness – though they may still be doing their functional, emotional work by releasing adrenaline, shortening the breath, raising the blood pressure and so on. There is plenty of evidence for these kinds of physiological reactions of which we are consciously unaware. And there is also evidence that certain anaesthetics, for example, achieve their effect by breaking up the 'dynamic core', and thus removing consciousness.

So the brain can achieve denial of anxiety, or the suppression of compassion, for example, by itself. No controlling self is needed to make this self-censoring system work. All the brain has to do is be able to learn that some of its inherent activities lead to trouble, and to switch the points on the train of thought so that it chugs happily off in a safer direction (while covering its tracks, so that there is no evidence that any such manoeuvre has taken place).

One last point about the modus operandi of the organ of intelligence. Inhibition is an active process. It is more like sentry duty than simply turning a switch off. The brain thus relies on two kinds of activity: excitatory, which makes other things more likely to happen; and inhibitory, which makes them less likely. One energises its neighbours; the other sedates them. Now there is some reason to believe that the amount of activity that the brain can sustain at any moment – excitatory and inhibitory put together – is limited. You cannot keep on lighting up areas of the brain, and then trying to cover some of them up, ad infinitum. Like a boy-racer's car at the traffic lights, with both the gas pedal and the brake flat to the floor, it would be likely to shake itself to destruction.

So, to put it very crudely, the more inhibition the brain has deployed – the more preoccupied it is with managing an impossibly complex portfolio of desires – the less 'free activity' there is left over to underwrite its excitatory activities. As the energy needed to hold all its preoccupations and defences in place becomes a greater and greater proportion of the total activation that is available, so the stream of consciousness may become thinner and thinner. Perception becomes greyer; emotional life more bland; physical activity more clumsy; thought more stereotyped and shallow. In an extreme paroxysm of anxiety and self-consciousness, the stream may dry up altogether, and we are left – for an instant, for a week - mentally blocked, emotionally frozen, and even physically paralysed. In cases such as 'hysterical blindness', inhibition has been known to close down an entire sensory channel, in order to protect the brain from witnessing (another) traumatic scene. Less dramatically, if self-interest conflicts with care, or delight with decorum, then more of the dwindling reservoir of neural activity has to be committed to deal with the glitch – by blocking the care (and then feeling guilty) or blocking the self-interest (and then feeling resentful), and then having to suppress these feelings (which undermine my self-esteem)…and so on, relentlessly and exhaustingly.

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[21] Gerald Edelman and Giulio Tononi, *Consciousness: How Matter Becomes Imagination*, Penguin: London, 2000.

The conditioned 'self', we might say, is none other than this convoluted field of irreconcilable forces, overlaid on the workings of the brain, and altering its *modus operandi*, like a computer virus. Just as a digital computer with a serial, one-thing-at-a-time architecture can be programmed to emulate a brain-like system that *looks* as if it is doing many things at once, so experience can install in the human brain a program that, when it is running, makes it *look* as if its proprietor were fundamentally selfish, or tense, or greedy, or concerned about what the neighbours might say. When the Self System program is switched on (i.e. when our whole complicated desire portfolio is running full blast), a massive expenditure of energy is required to run all the neural machinery that keeps us keyed up for what counts as profit or loss, nice or nasty, good or bad, mine or yours, acceptable to awareness or not.

Like the revving car, when the organ of intelligence – the ecologically embedded, physically embodied, amazingly intricate confection of matter and energy that I am – is put under great strain by such an escalation of complexity, all of its sub-systems may suffer. Perception gets driven by the need to be constantly on the look-out for what is good or bad, yet it is bleached of colour and detail. The art of contemplation – of seeing things as they are; that is, in their beauty – atrophies. One rushes round the art gallery, keen to see the latest artist's latest show, impulsively 'liking' and 'disliking', and hardly seeing at all. One can even sit on a meditation cushion chasing after a kind of peace that never ever comes when chased. The small absurdities that make life funny – a pigeon sitting calmly on a No Waiting sign; a sun-worshipper posing ridiculously on a beach – don't get noticed at all. Muscular systems that are designed with a built-in tendency to relax when not being used are clenched to dampen a feeling or a pain, and then get stuck like that, for fear it might come back, maybe for years. Of course the muscles end up yelling – that is, until we muzzle them with an analgesic.

I've presented this crude sketch of how the conditioned brain gets itself into trouble in a fairly informal, metaphorical, and sometimes even light-hearted, way. But the general picture is based on firm empirical foundations. And, of course, the real-life unhappiness created by these contortions is no laughing matter. You do not have to be a Buddhist to know that babies are hit because of it. Vast forests are felled because already-rich people have a greedy itch that they do not know how else to scratch. People die of shame, as well as ignorance. They fall asleep at the wheel because they were too worried or wired to sleep last night. People fight or have unsafe sex because, sometimes, they want to break through the drab veil of inhibition and *feel* something; while those who already feel too much (of the wrong kind of feeling) steal for the needle that will help to free them from their pain for a few hours.

Science now gives us a picture of personhood that places great emphasis on the biological, the ecological and the social. Instead of the lone sharp intellect, unsatisfactorily housed in a dumb decaying body, we find an exquisitely intelligent and sophisticated body that creates, amongst other things, intermittent puffs of consciousness many of which are highly suspect, simplistic and self-serving. The idea that conscious experience knows more about what is going on than the largely unconscious organism-as-a-whole, and can be trusted to intervene wisely in the flow of events, has become itself highly dubious. There is a Buddhist meditation that encourages people to consider that 'I *am not* the body; I *have* a body', and one understands the value of trying to break identifications with youth, appearance and vitality which will eventually, inevitably cause suffering as injury, illness and plain old age take their toll. But one should not jump out of the frying-pan into the fire of believing that there is an 'I', separate from the body, that somehow owns it. And there are many other indications in the Buddhist scriptures of the fact that we *are* bodies, embodied beings bound together in a wider ecological and social system, much more than we commonly think. To say that we *have* bodies is to perpetuate precisely that split between 'mind' and 'matter' which causes trouble, and which science now denies.

Liberation

Imagine what would happen if the self-virus of conditioned goals and identities such as I have described, installed in a bio-eco-social system such as I have described, were suddenly to be

switched off. What would happen at the level of goals and values; at the level of functional intelligence; at the level of conscious experience; and at the social level?

At the level of values ands goals, things would immediately become clearer and simpler. Things that had seemed to matter dreadfully would be seen in a truer light: as preferences and inconveniences, not as matters of life and death. Recall Anthony Robbins' 'Two step formula for handling stress. Step1: Don't sweat the small stuff. Step 2: Remember, it's all small stuff'.[22] I am not so sure about it *all* being small stuff. As I said earlier, I do not think I want 'not to sweat' the death of a loved one. That's not the goal. But so much of it is, and we know it is. Old people sometimes say that one of the compensations of getting old is that you finally stop worrying about what people think of you. If we could induce the brain to accomplish that clear-out of its motivational cupboard, maybe we could experience that benefit sooner: being more decisive; clearer about what 'really matters'; less blocked and conflicted.

At the level of the 'organ of intelligence', we would find that a kind of 'basic sanity' reasserts itself, as our intelligence becomes less at the mercy of these emotional currents. It is not that we have to clear emotionality out of the way in order to allow a dispassionate intelligence to emerge. It is that the clarification of desire brings with it a natural lessening of emotional complexity, and thus greater wisdom. Freed of the need to appear knowledgeable and decisive, for example, the mind can take its time when dealing with genuinely complicated situations – and thus come up with smarter ways of satisfying multiple constraints. What the poet John Keats referred to as 'negative capability' – 'that is, when a man is capable of being in uncertainties, mysteries, doubts without any irritable reaching after fact and reason'. Intelligence increases when you are able to wait: especially that higher form of intelligence known as creativity.[23]

At the third level, the felt quality of experience, we might expect a number of changes. As the background sense of panic and insecurity dies away, so greater peace of mind replaces them. One feels quieter and calmer. One might experience more marked rhythms between rest and contemplation on the one hand, and decisive action on the other. Relaxation returns as the default state of mind. And, as intelligence is freed of the constant need to solve desire-related problems, so there is more opportunity to see what is really out there, rather than what you expect or hope or fear or need to be there. The perceptual world becomes sharper and richer. And there may be another reason why this happens, too. Remember that a good proportion of the total pool of neural activity might have been dedicated to keeping trains of thought and perception 'on track' – relevant to the current knot of priorities – and that self-related defences have locked up amounts of inhibitory activity in protecting consciousness from troubling possibilities. When all this self-protection stops being necessary – like the end of a war – suddenly all these sentries can stand down. They are freed from their need to be vigilant for specific threats, and are able instead to subserve richer, more detailed perception of whatever arises. No wonder people often report bursts of physical energy and perceptual richness and brightness.[24]

And at the social-ecological level, as those barriers and defences melt away, how could there not be an expansion of the sense of self; a feeling of connection and belonging. Wherever I am, I am freed to remember that this is *my* living room; these are 'my people'; their well-

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[22] Quoted in Susan Hayward, *Begin it Now*, In-Tune Books: Sydney Australia, 1987.

[23] The evidence behind this paragraph is summarised in two of my books: *Hare Brain, Tortoise Mind: Why Intelligence Increases When You Think Less* (Fourth Estate: London, HarperPerennial: San Francisco, 1999), and *Be Creative* (with Bill Lucas, BBC Books: London, 2004).

[24] See William James, *The Varieties of Religious Experience*, Dover: New York, 1958; John Ferguson, *An illustrated Encyclopaedia of Mysticism*, Thames and Hudson: London, 1976; Guy Claxton, 'Neurotheology: Buddhism, cognitive science and mystical experience', in Gay Watson, Stephen Batchelor and Guy Claxton (eds), *The Psychology of Awakening: Buddhism, Science and Our Day-today Lives*, Samuel Weiser: York Beach, ME, 2000.

being is my well-being. I *belong* – and so I can stop longing to! I am reconnected not with some kind of higher moral purpose, but with an expanded sense of my own personhood, in which I am built to care as well as to compete. Unless my own basic needs are genuinely threatened - I am exhausted, famished or being attacked – suppressed care ('I'd like to help but I just don't have the time, sorry') floats back to the top of the priority-list, and it is perfectly natural for me to do what needs to be done for the common good, and to ask 'How can I help?' Love and compassion may be words that are too grand for this natural feeling of care and kinship.

Finding uses for spare capacity

Those of us lucky enough not to be homeless, imprisoned or starving thus find ourselves (much of the time) with spare capacity: reserves of intelligence that are no longer needed to serve the demands of the self-system. Like Marvin the Paranoid Android, in Douglas Adams' wonderful *Hitch-Hiker's Guide to the Galaxy*, we can respond to this by sitting around feeling depressed and under-used. ('What's up, Marvin?' 'I don't know…I haven't been there.') Or we can occupy ourselves in four rather more productive ways. We can look around and see what needs to be done. We can dance and sing and paint and invent, making creative use of our surplus intelligence. Or we can laugh – for innocent humour, and a delight in absurdity and ambiguity, are surely the efflorescence of enlightenment.

Buddha must have laughed a lot; I like to think, and Jesus must surely have had a ready smile. What fun it must have been to talk with Mohammed. Yet humour often dies on the page. And those who become leaders of churches and sects, after the founder has gone, may be more political and literal by temperament, and too busy establishing 'The Truth' to register the gentle subtleties of humour and irony. Small wonder that the lightness gets airbrushed out of the scriptures and the liturgy. Yes: remember that we are so lucky to be free and well-favoured, and that death comes without warning. But remember too that seriousness is not the same as earnestness or solemnity, and that the reason why the angels can fly is because they take themselves so lightly.[25]

And the fourth way of making good use of our spare capacity is through learning and inquiry, especially through putting the taken-for-granted under the microscope of our own attention, turning up the magnification and seeing what comes to light. The cultivation of mindfulness is often seen as a way of inducing a quieter brain, and indeed it is. The brains of experienced mindfulness practitioners show reduced activity in the frontal lobes, which may well reflect a reduction in the amount of desire-led planning, management and vigilance that is required.[26] Less inhibitory control is needed to make sure that the stream of consciousness keeps going *here*, and does not go *there*.

But meditation can also provide the context for the kind of investigation into taken-for-granted habits and beliefs that is called *vipassana*. Meditation practice often involves the development of complementary skill. One learns: to loosen involuntary inhibitory control (and cultivate mental and emotional poise in the face of whatever then arises). But also one sharpens the ability to stop the incessant movement of consciousness, which makes it difficult to see just what is going on in one's own mind, and to pin a particular mental habit or belief in the quizzical spotlight of awareness. The knack of 'mindfulness' allows unskilful patterns of thought to emerge from the shadows The knack of 'one-pointedness' allows them to be subjected to scrutiny, so that their antecedents and consequences can be clearly seen.

And woven into meditative experience, if we are lucky, brief passages of quiet brain time may begin to appear. But mostly these come to all-too-quick an end, and old habits of inflating

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[25] Many of the scriptures, of course, are not intended to be biographies; they are designed to distil essential teachings and methods of practice. For an indication of the Buddha's humour, see Richard Gombrich, *How Buddhism Began*.

[26] See Susan Blackmore, *Consciousness: An Introduction*, Hodder and Stoughton: London, 2003, for a review of these studies.

‘preferring’ to ‘needing’ reassert themselves. How to make ourselves more prone to these happy accidents is one question; how to stretch and stabilise them is another. And learning the knack of being able to turn the quiet power of attentive learning back on ourselves may the means to both these ends. The habit of contemplation both keeps us out of mischief, and also serves to loosen the power of other old habits, and thus make our minds – at every level – more hospitable places for peace, fun, kindness and creativity.

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