*Aping Mankind* by Raymond Tallis

*Aping Mankind*, subtitled *Neuromania, Darwinitis and the Misrepresentation of Humanity*, is a scathing attack on the purveyors of a peculiar modern idea that has swept through academic and intellectual circles (not to mention through the media and into public awareness) and left a twisted wreckage of cherished ideas and values in its wake, namely, the idea that science, through a reductive analysis of the brain, can explain all aspects of human behaviour.

Tallis focuses on the twin, deformed descendants of neuroscience and Darwinism, which he calls neuromania (the idea that *we* are nothing more than our brains) and Darwinitis (the idea there is no difference between us and animals therefore all elements of modern human behaviour can be explained by adaptive fitness for our evolutionary ancestors), as being the primary culprits driving this pernicious idea forward. In order to distinguish them from legitimate and valuable science, he labels them *scientism,* which he defines as “the mistaken belief that the natural sciences can or will give a complete description and even explanation of everything, including human life.”

(For) Neuromania

The idea that we are nothing more than our brains (or ‘neuromania’) has emerged naturally from countless research studies of people who have suffered some form of brain trauma or brain disease and then been observed by diligent scientists who have found unmistakeable evidence that virtually every mental state has a correlate in the brain. Even things as deeply personal as memories and personality and as supposedly objective as our sensory impressions can all be altered or distorted by physical changes to the brain. Neuromaniacs conclude from this that the mind and the brain are one and the same.

In addition to this, taking advantage of the fact that neural activity results in changes in blood-oxygen levels, a new type of imaging technology capable of measuring these changes, has allowed us to peer not just into the structure of the brain (as we do via MRI), but into the *functioning* of the brain, in more or less real time. This is of course, the technique that results in all of those colourful pictures that show specific regions of the brain “lighting up”; functional MRI (fMRI).

Tallis points to two additional developments that have helped secure neuromania’s claim to the crown. The first is the computational theory of mind, which holds that the mind-brain is nothing more than an information processing system (albeit a vastly powerful one). The second is the acceptance of the idea that physical objects, or at least, changes in those objects (e.g. nerve impulses) could be identical with things traditionally thought to be non-physical (e.g. thoughts and beliefs.) The strongest argument in favour of this, Tallis advises, is that our mental states have physical effects. If you believe that, for instance, you ran away (a physical action) because you were scared (a mental state), then you are saying that your mental state caused the physical action which means they must be the same type of thing, i.e. physical.

(For) Darwinitis

If the mind is identical to brain activity, then, since the brain is an evolved organ (Tallis does not dispute this at all), it must mean that the mind also evolved in a similar way, i.e. by natural selection, in order to serve the same purpose that all organs serve; to increase the organism’s probability of survival. The inevitable conclusion this type of thinking leads to is that we are wildly out of place and time because our minds have evolved to deal with a set of problems our Stone Age ancestors faced in the savannahs of Africa, the place and time where our species has spent most of its time.

Ideas bound up with Darwinitis include that we ought not to be able to have any objective knowledge (because the mind evolved to serve evolutionary success, not truth); genuine altruism and other moral acts are not about transcendental ethics but about ‘group’, as opposed to ‘individual’, selection; and we are generally unaware of what motivates us, unless we have taken a course in evolutionary biology, because the reasons we give are rationalisations which conceal the real (biological) reasons behind our actions.

Why Should we Care?

Does it matter that we are nothing more than animals and our brains are living our lives rather than us? Tallis gives us five reasons why we should look at these modern claims a little more closely before jumping on the scientist bandwagon. Scientism:

* Justifies human self-hatred and misanthropy
* Encourages despair and inactivity. After all, if we really are just animals (even worse; *deluded* animals) then trying to change things for the better will probably only make things worse
* Sanctions replacing “untidy, ill-informed” decision-making processes with a “biological justice” which connects actions with neural states
* Legitimises the supposedly Darwinian dog-eat-dog world in which we are helpless to do otherwise than carry out our primitive evolutionary programming
* Lends credence to the idea that, since we are all animals, there may be more animal in some than others, making it appropriate to treat such “degenerate human beings” worse

Of course, none of the above are arguments against either neuromania or Darwinitis. They are merely reasons we ought to pay closer attention to the ideas we are currently being bombarded with by intellectuals across all fields and disciplines.

(Against) Neuromania

*Technical Problems*

The first problem revolves around the fMRI technique itself. Because fMRI only measures changes in blood flow to busy neurons (not neuronal activity itself) and because increased blood flow typically lags behind neuronal activity, the increased blood flow may relate to more than one set of neuronal discharges. In addition, blood flow changes can only be detected when many *millions* of neurons are excited. Smaller neuronal excitations will therefore not show up at all on an fMRI scan.

The second problem concerns the crude nature of the experiment design. When a part of the brain “lights up” what this actually represents is only the *additional part* of the brain that becomes active over and above the various parts of the brain which are *already* active. Smaller changes tend to be ignored. What is even more shocking however is that the additional parts that become active can only be identified after the results of multiple trials have been averaged out. In one of the simplest experiments possible, where subjects were asked merely to tap their fingers, the test-retest correlation varied between .76 and *zero*! So much for the requirement that scientific experiments be reproducible.

The third problem concerns interpretation of the (already suspect) results. Consider one typical experiment conducted by Mario Beauregard who claimed to have found the neural correlates for unconditional love by scanning the brains of low-paid care assistants while looking at pictures of people with intellectual disabilities first neutrally then with a feeling of unconditional love. By subtracting the first from the second, he deduced ‘where’ the feeling of unconditional love was produced in the brain.

The first thing that probably leaped out at you as you read that last paragraph was the absolutely ridiculous nature of the task chosen to identify a higher-order emotion such as love. In what possible way can looking at a picture with a feeling of unconditional love even be considered a half-way sensible approximation of the real feeling of unconditional love, which is obviously made up of a myriad of beliefs, assumptions, feelings, prior experiences, expectations for the future, etc.

Second, we ought to be wary of this post-phrenological approach, which sets out to label and compartmentalise parts of the brain as controlling this or that emotion or mental capacity, when we know that even the simplest of tasks requires the whole brain to function as a unit. We have already seen that fMRI only captures *additional* neuronal activity. It is clearly overly simplistic to even suggest that something like love is therefore somehow ‘located’ there.

Third, even some impressive feats, like being able to tell whether a subject is looking at a vertical or horizontal line by merely looking at an fMRI scan bring us no closer to explaining consciousness than doing the same thing by looking at a person’s facial expression. They certainly fail to capture even the tiniest part of the *conscious* *experience* of the looker, which is precisely what the neuromaniacs conducting these experiments claim they are looking for (and in some cases, claim to have found).

*Conceptual Problems*

In fMRI scans, we find that some regions are activated again and again (and are therefore implicated again and again) in an ever-increasing number of totally different tasks. In addition, the same cognitive functions regularly activate different regions of the brain. Tallis gives the example of how something absolutely simple like learning to associate the word “chair” with “sit” involves multiple regions of the brain, concluding that attempting to discover *where* in the brain complex emotions like ‘love’ arise, is sheer fantasy.

As a final stake to the heart, even if all of the above problems were in some way surmountable, we are still left with the uncomfortable truth that even if we were able to identify, down to individual neurons, where, when, and how neurons are activated in the carrying out of every task, we would still be no closer to understanding what consciousness is like than a full printout of a person’s genome tells us what it is like to be that person. This is the problem with reductionism. You can dig down to the tiniest level in an attempt to understand a thing but the more detail you gain at the ‘micro’ level, the more you lose at the ‘macro’ level, until you’ve completely lost sight of the thing you were trying to describe in the first place.

*Mind and Brain*

When it comes to the so-called mind/brain problem, Tallis argues that we need to be careful of conflating *causality*, *correlation*, and *identity*. Neuromaniacs have made the mistake of treating correlation (as per fMRI scans) as either causation or identity (or both, in some particularly incoherent cases). It is neither.

Regarding the claim that mind states *are* consciousness (the identity claim), Tallis argues that if this were true then surely the one must resemble the other. But the conscious experience of the colour yellow is absolutely nothing like the neural activity that is supposedly the same thing.

In response to this objection, neuromaniacs invoke the “double aspect” theory, which holds that neural activity and conscious experience are two *aspects* of the same thing. The biggest problem with this is that before there can be any aspects of *any*thing, there must be a conscious experiencer; in other words, the double aspect theory presupposes conscious experience in order to explain conscious experience.

An analogy courtesy John Searle makes between water and H2O helps to clarify this. Water and H2O are the same thing, merely seen from two different perspectives; the former being experienced as wet, liquid, shiny, etc., the latter as a collection of atoms. The important point here is that both aspects *only* exist for a conscious experiencer (which is neither water nor H2O). The double aspect theory, in which brain states and mental states are different aspects of the same thing, doesn’t stand up because we need mental states (i.e. conscious experience) for there to be any aspects in the first place.

How about the claim that nerve impulses *cause* consciousness? This looks more promising because we can directly observe a chain of events which culminate in conscious awareness. Flashing a light in my eyes generates neural activity that snakes up my optic nerve and into my visual cortex producing the experience of seeing the light. This experience can be interrupted at any point and the experience will not be had. Even more compelling, some forms of epilepsy affecting certain parts of the brain bring about hallucinations. Once more, if the affected parts of the brain are removed, the hallucinations are stopped.

Looking at the case of epilepsy; if the brain is capable of causing hallucinations through some kind of electrochemical ‘misfiring’, don’t we have enough here to claim that brain states cause consciousness? Not quite. The reason for this is that the hallucinations must be considered in context, as *part* of the real, human *world* we all intrinsically belong to (not ‘world’ in the scientific sense of the word, but in the sense of a lived, experienced place full of meaning and significance); i.e. as part of a *normal* world *outside* those hallucinatory moments. Hallucinations have significance and meaning only because they take place in a human *world*, i.e. a world *already* populated by conscious beings who bestow significance and meaning on it.

The same thing can be said for the example of the flashing light. The nerve impulses certainly have a part to play in the whole sensory experience but they can only do so because a *world* already exists, in which they *can* play a part.

The general conclusion from the preceding discussion is that brains are *necessary* for consciousness (no brain, no consciousness) but not *sufficient* for it (merely having a brain does not guarantee consciousness). Hallucinations (or sense impression) produced in a stand-alone brain *seem* to make brain activity a sufficient condition for consciousness only because those hallucinations (or sense impressions) already presuppose the consciousness they are looking to prove.

*Dissecting Consciousness*

If neuromaniacs are to be successful in their task, they must be able to explain all of the elements of consciousness. Failure at any of these levels will result in overall failure.

The first element of consciousness Tallis investigates is that of *qualia*. Qualia are the “what-it-is-like”, the experiential aspects, of consciousness. What’s it *like* to see something yellow? The question sounds daft. It’s not *like* anything, right? Actually, it *is* like something; if it wasn’t, you’d never know you were looking at something yellow and you probably wouldn’t know the difference between looking at something yellow and something blue. You experience something when you look at yellow and that something is different from the experience you have when you look at blue. That ‘feeling’ is what qualia are.

Neuromaniacs have some problems explaining qualia. First, as we have already seen, nerve impulses look nothing like qualia. If we analysed the particular set of nerve impulses generated when we look at a yellow hat, we would never be able to infer that they produce the experience of the colour yellow. Moreover, the triggers for these nerve impulses are electromagnetic waves which have no hint of ‘yellow’ in them either. So, colourless waves of light stimulate colourless nerve impulses which somehow then generate the appearance of colour. This story can’t be the whole picture.

Another related problem is the fact that all neural impulses are near identical in nature (an electrochemical ‘wave’ that propagates across a neuron) and yet they are supposed to be responsible for the near infinite richness of phenomenal experience. In an effort to address this, appeals have been made to the *location* of neurons and *patterns of activity*. Neither seems to solve the problem though. It is hard to see why location should, or indeed how it could, be an adequate differentiating factor. And while at first glance, differing patterns of activity could do the job (there is plenty of scope for an essentially infinite number of different patterns of activity amongst the neurons in the brain), there is still the problem of explaining *how* a particular pattern of activity produces a specific quale (singular form of ‘qualia’) when there is nothing in the pattern which could even remotely correspond to that quale.

Yet another problem is how we can, not just *have*, but also be *aware* of our sense experiences. This has sparked a search for the neural correlates of consciousness (NCCs) which is supposed to identify the difference between neural activity that is, and isn’t, associated with consciousness. It is an odd fact about our brains that just about all of the neural activity taking place therein, happens without any accompanying conscious awareness. This is a real obstacle to any purported explanation of consciousness and if it’s true that there is no discernible difference between the electrochemical processes of the one or the other (as appears to be the case), impossible to solve with a reductionist approach.

The second aspect of consciousness is *intentionality*. This is the idea that the mental activity of a subject is directed towards, or is ‘about’, other things. Tallis notices one odd feature of intentionality, namely, that it flows in the opposite direction of the causal chain. The causal chain leading to visual perception travels from the object to the eye to the brain, but then intentionality somehow reaches back up that chain from the brain to the eyes to the object, *about which* we are ultimately concerned. This is to say that intentionality has no material causal explanation. Something has to happen to the final effect (the neural impulse in the brain) to enable intentionality to direct itself back outwards. This captures the difference between *registration* (a purely physical process) and *perception* (a conscious process), and nothing in the former goes any way towards explaining the latter.

Functionalists argue that the phenomenal aspect of consciousness (the awareness of what something *feels* like, what it is like to see yellow and how that is different from seeing green) are unimportant and all that matters is the *functional* role of consciousness, i.e. the registering of sensory inputs and the behavioural outputs that follow. But such an attitude, far from explaining consciousness, completely ignores it. Consciousness is not the processing of inputs and the production of outputs. That is what a computer does, but no one believes that a computer is conscious.

Tallis mentions Daniel Dennett as one such pundit. Dennett attempts to gloss over intentionality by claiming it is a product of the “intentional stance”, which is a way of understanding the behaviour of conscious beings. He claims that I cannot understand or predict your behaviour if I consider you as a collection of atoms and molecules – *the physical stance* – so I imagine you as an individual self capable of acting in accordance with beliefs, thoughts and intentions, even though such a fanciful creature doesn’t actually exist.

You can already see that Dennett, in describing intentionality from an external perspective, is completely ignoring the most important perspective, the one from within. We don’t ascribe intentionality to other people because it aids us in understanding their behaviour; we do it because we recognise intentionality in ourselves. How would we even know to ascribe it to other people unless we had first recognised it in ourselves?

The third aspect of consciousness Tallis discusses is concerned with *selfhood* (although he defers a full discussion of the self until later). He points out that there is nothing within a material organ in a material body that could ever possibly account for the *feeling* we have of having a certain viewpoint from which we ‘look out’ onto the world.

He also raises the problem of how consciousness unifies the multitude of sensory inputs into a coherent whole while *at the same time* retaining an understanding of the parts which make it up. So when our brain processes the experience of seeing a red hat, it parcels out different jobs to different places; there are neurons responsible for detecting edges and creating the impression of shape, for colour, for location in space, and for identifying what the object is. However, we don’t experience these aspects as a bundle of disparate pieces we then have to put together like a jigsaw puzzle. Rather, we experience the *whole* immediately as a complete, coherent perception. How is this summation accomplished? And then once accomplished, how is it that we *also* retain awareness of the individual parts of that whole (the different aspects the brain originally processed)? Tallis phrases it thus; “there is no model of *merging* of activity in the nervous system that would not lead to *mushing* of the merged components and a loss of their individual identity.” Consciousness is at the same time unified *and* multiple, and we have no inkling as to how this happens.

Tallis also points to a problem regarding the unity of consciousness *over time*. Human consciousness ‘lives’ in an explicitly *tensed* world; a world of past, present, and future. He makes the uncanny observation that in the absence of an observer, time has no tenses. The physical world, a world composed of nothing more than things like bodies and brains, has no tenses because there is no *one* (no *consciousness*) to perceive of a “now” as opposed to a “not yet” or a “then”. There are therefore no tenses in a *piece* of the physical world, such as a brain. Both tense and change make no sense whatsoever without presupposing a conscious observer. So, if the physical, i.e. scientific, world is fundamentally *tense-less*, then a description of that world (no matter how detailed) can never hope to capture what consciousness is because human consciousness is fundamentally *tensed*.

Next, Tallis goes into an interesting discussion on memory as it relates to everything we have been talking about above. Memory is not just a mental recurrence of something experienced in the past nor is it a pale imitation of some present perception. A single memory is quite different from a present percept because *we are aware that it occurred in the past*. We have what you might call ‘meta-knowledge’ of memories; we don’t just have the memory itself (perhaps a visual image), we also have independent knowledge *about* that memory.

One scientist, Eric Kandel, experimenting on the giant sea snail, *Aplysia*, has supposedly gone some way towards explaining memory. Upon receiving an electric shock in its tail the creature would reflexively withdraw and after a number of such shocks, *Aplysia* would perform the withdrawal movement even when a *non-painful* stimulus was applied to its tail. Kandel saw this as a model for memory as *Alypsia* was engaging in a form of *learned behaviour.* Moreover, as a result of his provocations he detected an increase in the size and strength of certain synaptic connections, meaning that neurotransmitters (chemicals that relay signals across the tiny gaps between neurons) were able to cross the synapse more easily. Voila! We now know how memory works. But do we?

Tallis points out that this ‘memory’, in the form of an altered behaviour, bears very little resemblance to anything approaching memory as you or I know it. There is absolutely no evidence that *Aplysia* remembers facts (semantic memory); has specific memories that it locates in the past (episodic memory); has memories it ascribes to its own past (autobiographical memories); or actively tries to remember events. And surely all of these things are absolutely fundamental features of memory.

How is it that scientists have convinced themselves they can explain memory by appealing to altered physical structures in a sea snail? Through loose use of language. They start with full-blown memory (tensed recall of an explicit past), then equate this with learning (the acquisition of a skill or knowledge), which they then equate with altered behaviour (as when a sea snail acquires a conditioned reflex), which can in turn be seen occurring as a result of modified synaptic connections in the brain.

There are a couple of problems with this. The first is that memory is *not* the same as learning. The second is that ‘learning’ the way a conscious human does it, is quite different from ‘learning’ the way a dog learns that when its owner says “sit down” it should plant its bum on the ground. And of course, learning is more than just exhibiting an altered behaviour. Yes, Kandel has explained what happens in the brain of a sea snail in response to certain stimuli but this hasn’t even begun to explain ‘memory’.

But couldn’t it be argued that he has started us on the road to a fuller understanding of memory? Possibly, but there are bigger problems at work here because, as we have seen, a material object is always what it is. It preserves no memory of what it was or what that could have meant for it. Demonstrating that a change in the brain prefigures a change in behaviour is as far from explaining memory as one could be.

One particularly revealing fact from the annals of neuroscience serves to illustrate just how futile this attempt is. In 2008, scientists found that the same neurons were activated in people recalling a scene from *The Simpsons* as when they were actually watching it. But as anyone (except neuromaniacs apparently) can tell you, there is something *fundamentally different* about remembering a TV scene and watching that scene for the first time. That neuroscience can’t even begin to explain this difference only proves just how inadequate its theories are (because, as Tallis would argue, they are looking in the wrong place).

*The Impossibility of There Being a Brain Science of Consciousness*

As I have already mentioned, the point of Tallis’ arguments are not that neuroscience is unable, at the moment, to explain consciousness; it is that science is fundamentally unable to do so and the reason for that is physical science deliberately *excludes* consciousness from its considerations. Science examines the world *objectively*, as it exists independent of any observer. In other words, neuromaniacs strip phenomenal consciousness from the world and then act as if they have made a startling discovery when they find that physical processes are all there are.

Tallis illustrates this by considering a table as seen through a human’s eyes and the eyes of science. A conscious human sees the table as being ‘bigger-than’ or ‘smaller-than’; ‘nearer-to’ or ‘further-from’. It has a texture, it feels hard, it is a place for resting my hands or placing a cup on. Science sees none of this. Science reduces the table to a set of numbers. It is ‘x’ metres long, ‘y’ metres wide, and ‘z’ metres high. It describes the atomic composition of the table and analyses the frequency of the light absorbed by it.

The former description (as a human sees it) gives us an *appearance*; the latter (as science sees it) gives us a *measurement*. And that is the key idea; the material world ‘in-itself’ lacks appearance of any kind. It lacks colour, perspective, nearness, farness, utility, and any other elements that give a thing an *appearance*, that make a thing look *like* something. It is therefore categorically impossible that we should ever hope to find these things *in* a material object which is part of the material world. And since consciousness is, at its most fundamental level, appearance, we search in vain in the physical activity of a physical brain for the elements that make up consciousness.

(Against) Darwinitis

Darwinitics claim that our differences with animals are superficial only and merely cover a deeper identity. They claim the modern human working in an office is driven by the same motivations as an ape in the jungle. Tallis completely rejects this. Of course, he is not denying that humans evolved according to natural selection, just like every other organism on the planet, nor is he denying the obvious similarities this entails. However, this doesn’t mean we are *nothing more* than animals or like animals in *all* respects.

Many aspects of human lives are completely unique to humans alone out of the animal kingdom – our capacity for abstract thought and desire for knowledge for example – but Tallis elects to focus on those modes of behaviour that we share with other animals. He does this to demonstrate that our differences from animals don’t just lie in our higher faculties but pervade our everyday lives. One example he gives is that of eating. All animals eat but likening a chimpanzee grabbing a banana off the tree in front of him and stuffing it in his mouth to a human family sitting around the dinner table after one parent has gone to the supermarket to purchase food grown and transported to a central site explicitly for strangers, lugged it all home, cooked it by following a recipe someone they don’t know has recorded on the internet, set it all out according to a number of customs and traditions… etc., is to completely miss the mark. Let’s not forget that chimps are living roughly the same lives our common ancestors were living six to seven million years ago.

Another oft-cited fact is that we share 98 per cent of our genes with chimpanzees. This is less damning than is commonly thought. First, we share 50 per cent of our genes with a banana. Second, “the expression of genes is hugely influenced by the environment in which the organism finds itself.” The environment human children find themselves in full of artefacts, institutions, laws, customs, norms, education, training, etc., couldn’t be more different from that of a chimp in a jungle. And third, we have to ask what ‘share’ means. ‘98 per cent in common’ means nothing unless we know the size of the unit; at the level of whole chromosomes, we share zero per cent with our closest cousins.

It’s important to understand that Tallis is *not* denying that human beings evolved by natural selection or that, biologically, we are a part of the animal kingdom. We did and we are. The evidence for this is irrefutable. What he *is* saying though is that at some point on that path, through some means no one has yet been able to identify with any certainty, we became conscious of ourselves and our environment, and *this development was of such magnitude that our lives have since become fundamentally different from those of other animals*. Of course, this is not to deny that some animals are more or less conscious than others. But it *is* to deny that any animal comes anywhere close to enjoying the benefits of consciousness, and therefore living in the explicit, human world that we take for granted.

Let’s look at another example. Sex. All animals do it, including us. If you look at the actual act alone, isolated from anything else, you could be forgiven for concluding that we are little more than animals. However, this would be to ignore the entire context within which any human sexual encounter takes place. No animal is even remotely capable of building up anything like the extensive array of rules, customs, rituals, taboos, habits, preferences, or industry every act of sex takes place within. This is not to say all of these things are helpful or positive; just that they exist and we made them. Sure, the drive for sex in all animals alike is biological and evolutionary in nature but what we have done with that drive, what we have made out of it, speaks far more to our differences than our similarities.

More generally, this is what Darwinitics do. They deliberately strip away all of the uniquely human context surrounding something, leaving us with a purely physical act which takes place at a single moment in time, and then proclaim that there is nothing distinctively ‘human’ about it. Of course there isn’t. They were the ones who took the humanity out!

Tallis identifies Darwinitis as operating by what he calls a ‘pincer’ movement. The first arm of the pincer is the way we animalise humans, likening our behaviour to that of animals. His example is equating ‘learning behaviour’ in both Daisy the cow after she bumps into an electric fence and avoids it thereafter, with someone with a young child who decides to do more babysitting this year so she will be able to pursue a degree the next, thereby improving her chances of getting a better job. The ‘learning behaviour’ (Daisy and her fence / our mother and her degree) that is taking place in both cases is so different that to equate them is bordering on the insane.

The second pincer arm is the way we humanise animals. The classic example here is tool use. We often marvel at the way chimps use sharpened sticks as ‘tools’ to poke into trees and stab bushbabies to death before eating them. The problem with calling this ‘tool use’ is that the chimps are one-trick ponies that cannot use their ‘tools’ for anything else, clearly demonstrating that they don’t understand the concept of a ‘tool’. They don’t teach their young how to make these tools nor do they make any other ‘tools’. They are, in fact, performing the same feats of ‘tool’ use that their ancestors probably did millions of years ago. If chimps had even the tiniest inkling of what a tool was, they would be doing far more with their sharpened sticks than they do now.

*Memes*

Despite Darwinitics claims, even they realise the gap between humans and animals is too large to disregard completely but fortunately, in the *meme*, they have found a putative mechanism to rescue their theory. Memes are simply mental phenomena (beliefs, ideas, etc.) viewed as units transmissible between brains. In this, they supposedly operate on our minds exactly the way genes do on our bodies. Memes, like ‘selfish’ genes then, exist in order to replicate and they do this by occupying human minds. Ones that fail to ‘survive’ (i.e. confer benefit on the organism) are subsequently weeded out by a meme-ish version of natural selection. Dennett goes so far as to claim that human consciousness *is* a huge complex of memes.

The first problem with the whole notion of memes is the idea that in order to be transmissible (like a gene) a meme is supposed to be a *unit*. In what sense can ‘trust’ or ‘equality’ or ‘opposition to slavery’ (all viable memes) be considered units? What are they units of? Where are their boundaries? How do we measure them?

Second, memes are completely inadequate to explain the complex, daily activities we all engage in as human beings. The possession of thousands of supposedly discrete memes in the form of individual concepts/beliefs can hardly account for the rich and subtle consciousnesses through which we experience the world.

Third, if meme theory is correct then it itself is just another meme propagating through human minds like a virus and its success owes nothing to its being true. The most we can say about meme theory is that it confers some kind of benefit on its holder.

Fourth, genes confer their benefits or handicaps on us whether we wish them to or not. Ideas however, don’t act on our minds in the same way. We frequently think about new ideas carefully and choose to accept only those that appeal to us after much conscious work. Naturally, this will involve considerations of other ‘memes’ we might have acquired over our lifetimes but the point is that this is a conscious, deliberative process; not one in which we are passive victims, as we are when it comes to our genes.

Closely related to this, memes (ideas) themselves only come about after much mental effort. Good ideas don’t just fall into our laps fully formed without any conscious intervention. Sure, we might get a flash of intuition at times but this is *always* preceded by an abundance of deliberate, active thought (you won’t get any flashes of intuition about neurons if you haven’t made the conscious decision to study them in the first place) and followed by more deliberate, active mental effort to flesh out that initial ‘brainwave’.

In a simplistic sense of course, ideas *do* move through human minds, surviving on their merits, but Darwinitics aren’t making this simple argument. They have to do more than this because they have to link cultural and societal progress to biological evolution. Ideas *can* be thought of as transmissible ‘units’ but Darwinitics need them to acquire the power of genes, that is, something acting *on* humans without conscious interference, because that is precisely what they are trying to explain away; human consciousness. Hence the invention of some new terms, replacing ‘idea’ with ‘meme’ and ‘cultural progress’ or ‘development’ with ‘cultural evolution’, precisely because this elevates them to the same status as biological evolution, that is, an *un*conscious process acting on passive organisms with the automaticity of Darwinian natural selection.

*Is Natural Selection Capable of Generating Consciousness?*

Although Tallis has no qualms at all about natural selection as the mechanism that produced humans he does question whether evolutionary theory is able to fully account for consciousness. He identifies two problems with the idea; 1) it begins with matter and ends up with mind; 2) if consciousness was selected for, it must have conferred benefits on the organism.

To the first problem, Tallis begins by asserting that he doesn’t find the Creationists appeal to “irreducible complexity” convincing and discards this along with the associated “intelligent design” claim.

Taking vision as a starting point, it is eminently plausible that the eye, as a method for navigating the world which confers significant advantages on its possessors, evolved by natural selection to the point it has. However, “chemical or electrochemical sensitivity to light is not the same as *awareness* of light.” The evolution of the eye cannot in any way contribute to the intentional gaze that we have seen reaches back up the causal chain and out to the external object.

Second, the content of visual awareness (colour, nearness, etc.) does not exist in the light itself (which is purely electromagnetic radiation). How can natural selection select for something that doesn’t exist?

Third, it is difficult to understand how some organisations of matter have become aware while others haven’t, particularly when we consider the difference between neurons in the human brain itself that are and aren’t associated with consciousness.

Tallis is also sceptical about the second problem; that of the survival value of consciousness. Given that the brain consumes a huge 20 per cent of our energy supplies, to have evolved by natural selection it must offer significant advantages. The biggest hurdle to overcome here is the fact that long before memory, conscious deliberation, self-awareness, etc., evolved, a more likely alternative is available at every evolutionary step, i.e. more efficient *un*conscious organisms.

We tend to think of it as obvious that consciousness confers benefits. Look at us. We dominate the planet. True, an animal that is conscious (even one with our comparatively vastly inferior physical attributes) has a far better chance of surviving than an *un*conscious animal, but this is thinking about evolution from a *retrospective* view; looking back from a situation where consciousness is already in place. When it comes to evolution however, we must adopt a *prospective* view, looking forward from a *pre*-conscious point. The uncomfortable fact is that an organism that has to deliberate and choose from a number of alternatives is at a huge disadvantage to the biological machine that only acts according to the laws of nature. Humans make mistakes but unconscious mechanisms don’t.

There is also a glaring contradiction in the Darwinitic’s claim that consciousness conferred an evolutionary advantage on us because according to them, our selfhood and our sense of agency is all an illusion masking just another organism ruled by material cause and effect. In that case, how can an ability to rehearse options and choose from them *that we don’t actually have*, ever confer an actual advantage?

Language Games

We have already seen how the misuse of language makes Darwinitics’ claims seem more plausible. Next, Tallis dedicates a whole chapter to dissecting the way neuromaniacs have deceived themselves through the sloppy use of language. The difference between Darwinitic language slides and neuromaniacs’ is that while the former conflate humans and animals, the latter impute human characteristics to physical processes in the brain.

It starts with perfectly fine talk about how a camera “sees” a scene or photoelectric cells “detect” light and “instruct” a shutter to open or close. Although we all know that a camera isn’t *really* seeing anything, this kind of talk marks the beginning of a slippery slope that becomes worse when we carry it over to computers. Because computers are vastly more sophisticated than a camera (an old-fashioned one anyway), we often think of them as “doing calculations” and it’s less clear that we have remembered that without the human being using the computer, nothing would be happening.

Add to this the fact that brains can be described in a similar fashion to computers and since computers “calculate”, “detect”, “signal”, etc., then it only makes sense that brains do the same. Tallis cites a passage from the book, *Making up the Mind,* which says that, “we can see… predictive activity if we look directly at the activity in the nerve cells”, which sounds innocuous enough until we realise that nerve cells are completely incapable of “predicting” anything, as they lack an explicit sense of tensed time. Although it is subtle, when we don’t keep in mind that our descriptive accounts of physical matter aren’t literal, it is easy to inadvertently smuggle consciousness into matter, making the materialist account of consciousness seem more plausible than it is. As Tallis quips, “when you personify the brain and bits of brain then it is easy to “brainify” the person.”

This leads naturally into another of Tallis’ bugbears, the computational theory of mind, which essentially holds that the mind is to the brain as software is to hardware. This is a tempting conclusion to draw but Tallis offers three objections. First, computers are not conscious, and those who claim that AI is on the way are fundamentally unable to tell us what additional features are required to make them conscious. It seems unlikely that complexity alone will get us there. After all, a Cray supercomputer is infinitely more complex than a calculator but is still just as unconscious.

Secondly, consciousness is not computational. To see this, we need only think about what happens in a computer. All computers do is essentially run vast quantities of small currents through microscopic circuits, enabling them (in the hands of a conscious user) to perform calculations. If consciousness were the same as this, what part of this process would it be? The moment a current leaves one component, the moment it enters another, the time it spends in between? Something crucial is still missing from such an account.

The third objection centres on another lexical slide; this one concerning a single word, “information”, and tackles the assumption that brains, minds and computers all acquire, process, store, and transmit information. ‘Information’ as we typically use the word means knowledge communicated concerning a fact, event or situation. However, ‘information’ also has a technical use in engineering, where it is conceived as ‘information content’ and is used to *quantify* information. In this specialised sense, ‘information’ is measured by the amount of uncertainty it resolves. This allows for an easy assessment of the value of the information by identifying the number of possible alternative messages it has been selected from and the probabilities of the different messages.

As you can see, the two definitions have almost nothing to do with each other and a message filled with meaning in the normal sense of the word may have less information content (in the technical sense) than a meaningless one. Tallis gives the example of A asking B if she loves him; surely one of the most important and meaningful requests for information one can make. B can answer either ‘yes’ or ‘no’. This yields an ‘information content’ of just one binary digit (bit). By contrast, a completely meaningless message composed of random letters of the alphabet (i.e. with each letter having a 1 in 26 probability of appearing) will generate an information content value of between 4 and 5 bits.

Next, all neuromaniacs had to do, armed with this new definition of ‘information’ stripped of all traces of anything remotely human, was slip this into a description of the human mind. The way they did this was by re-describing perception as ‘information’ processing and reducing the nervous system to a transmitter of that ‘information’. Of course, human perception and the way we are situated in the world is nothing like merely being informed, or else to be conscious would amount to nothing more than being well-informed. It is also ludicrous to suggest that human consciousness is built on reducing uncertainties (which is the definition of ‘information’ neuromaniacs have elected to use).

Tallis also notes the curious move here which both “*dehumanizes perception* and *anthropomorphizes the organs of perception*.” The perceiver becomes nothing more than a receiver while the sense organs are treated as if they have goals and functions.

We are now well and truly on a slippery slope to nowhere, the highlights of which Tallis points out as follows; first, all energy outside the body is treated as information. Now they don’t have to solve the problem of where this ‘information’ the brain processes comes from because it’s already present in the energy impinging on the nervous system. All the human system has to do is extract and process it.

But even this presents problems so we are told this information doesn’t even have to be extracted; it is simply there for free, whether it is taken or not. *All* organisms, conscious or not, are actually information-processing devices. Indeed, Richard Dawkins tells us that information is *embodied* in all organisms, specifically in the genetic material. Of course, the idea that the structure of an organism amounts to information *in itself* is simply false. If it were true then Tallis notes that being a crystal would be a sufficient condition of being a crystallographer.

You might still be thinking that energy and structure *are* information; after all, we can learn something from studying them. This is true, but who is it information for? A conscious person. Subtract consciousness from the equation and there is no such thing as information, that is, “knowledge communicated concerning a fact, event or situation”. And what’s more, once we isolate information from consciousness any kind of nonsense becomes possible. Which brings us to the final step on our slippery slope; the very fundamental particles that make up the universe – atoms, electrons, and so on – turn out to be nothing more than bits (binary digits) of information. This means, the universe is not an information processor *like* a computer, it *is* a computer. One can’t help but wonder if this universal computer has upgraded to Windows 10 yet and whether this will cause any future compatibility problems.

So How *Did* Consciousness Arise?

Somewhat surprisingly, Tallis gives a “tentative explanation” as to just how human consciousness may have arisen in a world of matter. In a nutshell, he theorises that our first person mode of existence emerged as a consequence of our opposable thumbs, which combined with an upright position, allowed us to use our hands as “proto-tool[s]”. Tallis’ theory is briefly summarised in what follows.

The opposability of our thumbs and the sheer dexterity we possess in our other fingers combined to give our ancestors’ hands unprecedented versatility for interacting with the world. On top of this, the almost unlimited range of different possible movements our hands were capable of, gave us a *choice* as to which method we would select at any given time. It is these features that created the “intuition of the *agency* of our own bodies and the intuition of our bodies as our own and, indeed, as *ourselves*, and hence of ourselves as agents.” (He calls this the “existential intuition”) The key idea here seems to be not that we could *do* more with our hands but that our hands functioned so effectively as proto-tools they gave us an explicit sense of being “one who *does*”, of “being a self that wills things to happen.”

Next, moving into the upright position contributed to this increasing sense of self-awareness by freeing our hands and raising us up above the world. The significance of this lies in the outward *gaze* we, as embodied subjects, could then take fuller advantage of; a gaze that heightened the sense that other objects are different from me, further strengthening our sense of being a subject.

Because we were already familiar with our hand as a proto-tool, this made the development of man-made tools in some ways a natural extension of this. This is important because Tallis links tools to the development of language, obviously a crucial element in our history. One reason that he thinks this is because language appears to have surfaced only around 40,000-100,000 years ago whereas the earliest tools date back about 2.8 million years. He argues that tools functioned as abstract, general, and visible *signs*, external to the body which let us appreciate them as proto-linguistic (language functioning, in large part, as a set of signs).

Tallis points out another step we took prior to the development of language. As an embodied subject *gazing* out on an object in the world, I am aware that it is separate from me, i.e. that it “exceeds the experiences that I am presently having of it” and there are other perspectives from which different properties might be disclosed by the object. All of this combines to open us up to another crucial idea; that *others are selves* and they may have a different viewpoint on the same object. This awareness leads to us desiring to draw others’ attention to our viewpoint, which we do by pointing. In this way, the object becomes located, not just in a physical space, but in a public domain, a world we share *in common*. This shared, public space provided the background to true linguistic communication.

Once we acquired language, we gained the ability to *refer* to other things; things that may or may not be present to us physically. We achieved the capacity, unique to humans, to refer to things particular or general, concrete or abstract, real or imagined, and things that exist now, existed in the past, or will exist in the future. This created a world of possibilities and facts, “*that*” such and such is (or is not) the case; so-called *propositional awareness*. Tallis calls this the world of “Thatter” and its significance for consciousness is that it (‘facts’ as opposed to ‘experiences’) belongs to everyone. This world is communal in a way that the private world of experience is not. Tallis even says that “it is at least as true to say that we live in a common space of facts… as that we live in physical space”.

The language we use to refer to the world of “Thatter” is not a part of the causal chain in exactly the same way that we saw intentionality isn’t. When we use the word “cat” it is not always the effect of an actual encounter with a cat. If it were, we would no more have risen above the physical world than monkeys who have differentiated cries for different predators. This fact (that our language is not the direct effect of a material, proximate cause) is also connected to intentionality inasmuch as our utterances are explicitly about referents quite distinct from those utterances.

All of this also opens another important realm for us; that of *possibility*. There is no possibility in matter; matter just *is*. It is through language, the world of “Thatter”, and the recognition of multiple perspectives on an object different from *me*, that we came to develop a normative sense that there might be a way things *ought* to be. This sense lies at the root of ethics and rational enquiry.

Our emotions, too, are experienced in a world full of “that”; full of propositional awareness. We experience fear “*that* [such and such may be the case]” and this fear may be immediate or weeks from now, extending beyond the immediate, physical world of cause and effect.

The take home message from all of this is that we “inhabit a shared world of acknowledged actuality afloat in a shared ocean of explicit possibility: a world of facts not just one of bumped-into objects and forces.”

Tallis notes that this process was not a sudden transition but one that took place over successive generations which ‘inherited’ (not literally of course) the progress of their ancestors. He suggests millions of years might be an appropriate timescale for the “lighting up” of human self-consciousness. Tallis also observes that infants take advantage of this trans-generational progress, acquiring “off the shelf” millions of years of human development before the age of ten.

Perhaps surprisingly, Tallis gives short shrift to the idea that brain size had much to do with our developing self-consciousness. The reason for this is simple; *H. Erectus* (about 1.5 million years ago) had a relatively large brain compared to other hominids, culminating at about 70 per cent the size of the modern human brain. It continued to increase until the emergence of *H. Sapiens* (about 200,000 years ago) but since then, changes in brain size have not even come close to the changes we have seen in human life. What this suggests is that while increased brain size may have been a necessary condition for self-consciousness, it wasn’t a sufficient one.

Freedom and the Self

*Freedom*

As a prelude to his discussion in this section, Tallis points out how unusual it is that scientists should attempt to prove our *universal determinism* through experiments that reflect only the most atypical, isolated actions of which we are capable. If we really were simply nodes in a causal chain, *all* of our acts would betray this fact, not just a tiny subset of them.

The first example of this is an experiment in which people were approached by a beggar and asked for money. If they were approached outside a bakery with the smell of freshly-baked bread in the air, people were more likely to be generous. However, these people would give reasons for their generosity that had nothing to do with the smell of bread. The conclusion from this was that their reasons were all empty rationalisations of behaviour they, in effect, had no conscious control over.

There are three reasons this kind of experiment lacks universal applicability. First, the request only required a simple ‘yes’ or ‘no’ response. Second, the action was not integrated with or related to anything else happening in the person’s life, effectively divorcing it from the meaningful world we all live our lives in. Tallis offers a counter-example; the number of smiles he receives in the car park would not determine whether he enters the hospital where he was due to carry out a clinic. Third, the very fact that we can discover how we are sometimes deceived illustrates that we are, in fact, operating at a level above the one in which the deception is occurring.

The classic experiment that is used to deny our freewill is the one conducted by Benjamin Libet. In the 80s, Libet asked participants to flex their wrists at a time of their choosing and note exactly when they made the conscious decision with the aid of a large clock recording the time in milliseconds. He found that their conscious intention to act occurred at least a third of a second *after* physiological precursors (called the “readiness potential”) to the movement had been triggered in their brains. The conclusion drawn was that our brains make our decisions without our conscious approval.

Tallis has no qualms with the experiment itself, but rejects this conclusion for a couple of reasons, both related to the relative isolation and meaningless nature of the act in question. First, the movement itself (the flexing of the wrist) was only a tiny part of what is actually a much more large-scale action; i.e. taking part in Dr. Libet’s experiment. This ‘larger’ act involved far more movements than simply flexing a wrist; it required signing up, setting aside time in a busy schedule for the trip to the clinic, desiring to help the scientist’s investigate freewill, etc., and began days or weeks before the final, pivotal movement actually took place. There is absolutely no evidence that any of these prior actions took place without the participant’s conscious say-so.

Secondly, we perform many multi-stepped actions without explicit conscious deliberation at every node. I didn’t consciously direct every step that brought me to the bus today but it doesn’t follow that it wasn’t my decision to take the bus to go to work. You can see that securing the determinist case depends on distorting the concept of what constitutes an action by removing all context – which is precisely where our actions get their meaning and relevance; their *human-ness*.

The idea is that freewill can never be found in a laboratory in a movement isolated from the ‘real’ world because it is precisely in that ‘real’ world that freewill exists; in the sphere of intentionality that we project outwards into a world full of significance and purpose.

Neuromaniacs also often try to describe our actions as the purely physical effects of purely physical causes. Tallis acknowledges that the past certainly informs our actions in the present but holds it is a mistake to see these actions as merely passive effects. For a start, much of our past exists for us in a directly explicit manner, not as a ‘hidden’ substrate acting on an unwitting pawn. In addition, all of the experiences in our past must somehow be brought together to act on us. The way this happens is through “a sustained, forward-looking, explicit intention”. In acting, we aren’t pushed from behind by causes; rather we are pulled from in front by reasons. It is this intentional aspect of our consciousness that drives our actions, not past events crystallised in our brains as “drives”, “motives” or “instincts”. These aspects are only capable of inspiring general and stereotyped behaviour, not behaviour which stems from a “sustained intention informed by an explicit goal”.

In another example of an apparently involuntary action, Tallis considers catching a ball. It is clearly impossible to consciously direct every movement that goes into this act which requires perfect timing and exquisite fine motor control. Couldn’t we then say that it was our body that caught the ball, not us? No, because this action only came at the end of a whole chain of events that required a number of deliberate and intended steps; deciding to play cricket, turning up at a particular time, taking the time to learn the rules of the game, practicing for days/weeks beforehand, etc.

But after all of this, you may still wonder how we can be free living (as we do) in a physical world governed by unyielding laws of nature, without at the same time breaking those laws. This seemingly miraculous feat is accomplished thanks to the “public sphere” of “Thatter” discussed earlier, in which we exist in a mental space that transcends the matter around us and from which we are composed. This gives us the ‘space’ to step back and *use* those physical laws in a way other animals can’t even dream of.

Tallis specifies three characteristics of a free act. First, the action should be *expressive* of who I am. This means that it should be rooted in, and make sense with respect to, a frame of reference that is uniquely *mine*. Second, I should *initiate* the action. This flows from that counter-causal intentionality discussed earlier. Finally, my actions should *deflect* the course of events in some way rather than merely being just another natural occurrence. That this is possible is evident in the cities we build, the man-made objects we populate our world with, the human institutions we create, and the *extra*-natural social facts and thoughts that fill our lives.

To end this section, Tallis asks: if freedom really is an illusion, where did it come from? If all there is, is material causation, why should one tiny node in this causal chain suddenly decide, without any foundation, that it is a free agent?

Of course, the immediate Darwinitic response to this is to say that this illusion helps us survive by “preventing us from falling into a suicidally fatalistic state of mind”. This is an obviously contradictory statement. If we are truly just links in a causal chain from which we cannot escape, how could the illusion of freedom possibly be an aid to our survival? If we really aren’t free then nothing we do (or think) can *really* affect the world. Your genetic material is going to make it to the next generation or it isn’t; your thoughts about that don’t change anything, in which case the illusion of freedom can’t confer any advantage whatsoever.

*The Self*

The notorious sceptical philosopher, David Hume, famously held that personal identity was a fiction. In looking within to find something he could call *himself*, he observed that he was always met with nothing but raw perceptions. He could never find a *self* that was having the perceptions. Tallis points out though, that Hume was looking in the wrong place. He was trying to find the self as a perception among other perceptions. However, he was also looking for a self that endures over time; that *has* perceptions. These are fundamentally irreconcilable demands. One can never find something that endures over time by looking at fleeting impressions.

John Locke sought our identity in consciousness, specifically in memory. This is more promising because memory links individual moments of our life together. Still, the self as memory is clearly incomplete. First, even though we can’t remember most things from our childhood we still think that little person running around the backyard without any clothes on was, in fact, us. Second, we are justified in wondering whether memories have to be in a state of being remembered to bind our ‘selves’ together. Clearly, we are not actually engaged in remembering even a fraction of the memories that make up our lives at any one time. Yet, we still have an enduring sense of self. Third, our memories are not always accurate. Research studies have demonstrated this quite conclusively. How do false memories fit into a conception of self? Finally, Bishop Butler pointed out that *consciousness* of personal identity cannot itself constitute personal identity because it *presupposes* it. There is a sense that these memories make up my *self* precisely because they are mine.

Tallis goes on to consider the body as the basis for our sense of a continuing identity over time. Of course, there are problems with this too. The most important being that it fails to capture the essence of what we mean by the *self*. While it does give a stable ‘location’ in which we can place our *selves*; it lacks the subjective dimension that seems necessary to tie that collection of atoms and molecules that is your body together. Without the addition of a *person*, a physical body can be thought of as one body, a bunch of organs, millions of cells, and so on. There is nothing to give it the unity so important to a *self*.

Naturally, Tallis’ conclusion is that the self needs “both psyche and soma”, the former giving us an internal, and the latter an external, enduring sense of self. However, we shouldn’t think of this as a composite like “an engine and a chassis, or a ghost and a machine”. To see how we *should* think of it, Tallis eschews the angle we have been looking at the self from thus far, that of continuity of identity *over time*, and advocates we look instead at our sense of identity at *any given time*.

This naturally brings us back to Tallis’ “existential intuition”; the intuition that I *am* and that I am *myself*. We have seen how this first precipitates in the knowledge that I am my body before expanding into a public sphere we share in common with other “I am’s”.

Tallis imagines a newborn, in whom the psyche and soma are one: the “I” identifies wholly with its body. From here though, this inchoate “I” gradually begins to dissociate from the body, awakening to it as *mine*, even as it uses this body to catapult itself into a personal world which it also shares with a wider community of minds; the human world.

We must understand this “at any particular time” aspect of the self before we turn our attention to the self as the same thing “over time”. “The intuition “that I am this” must precede any question as to whether I am or am not the same “this”. But once I understand how the “existential intuition” grounds *me* in each moment, the fact that *I* (mentally *and* bodily) am the same over a collection of those moments follows reasonably effortlessly.

The Humanities

We have seen how neuromania and Darwinitis have made waves in the sciences but Tallis also bemoans the fact that they are sweeping through the humanities as well and taking no prisoners as they do. Their *modus operandi* has three aspects. First, they minimise or completely ignore the non-biological reality of persons, societies and institutions. The public sphere, the very place our humanity lies in, disappears completely. Second, they re-present common sense intuitions as scientific truths revealed by the sciences (Tallis amusingly calls these “*neuro-truistics*”). Third, as we have already seen, the conclusions of these studies are frequently based on laughably simplistic caricatures of real human life. This makes them easy to perform and analyse but also restricts their scope. If you look for something like freewill by *only* measuring brain activity, is it any surprise that your findings are then expressed in terms of brain activity? If you reduce human life to responses to stimuli and design experiments that reflect this assumption, it’s inevitable that you will discover that human life *is* response to stimuli.

Simplification rears its head again in the broad categories neuro-evolutionary disciplines trade in, “reward”, “pleasure”, and so on. The so-called “pleasure” section of the brain lights up when we engage in some activity and, *voila*, we have identified the part of the brain that is associated with (read that as ‘controls’) that act and the reason we perform it. Never mind that this same section of the brain lights up when we help an old lady cross the street (perhaps after walking past a bakery), take a drug, or masturbate. A science that cannot distinguish between these pleasurable activities is nigh on worthless.

*Art*

Neuromaniacs have recently taken to analysing art works by looking at the effects they have on the brain. For example, cubism apparently appeals to us because there are “neurons that will respond exclusively to a particular object, at various viewing angles.” Semir Zeki claims that the artist Mondrian appeals to cells in regions V1 and V4 of our brains.

As you can imagine, Tallis has a field day with this. Identifying the neurological processes by which we respond to edges, angles, straight lines, etc., doesn’t tell us anything about the way we, as human beings, understand art. If cubism works on our brains the way neuroscientists argue it does, then it is impossible to see why some of them took so long to be liked, how people evaluate them differently, and why we react differently to the same painting on different occasions. In addition, this approach completely fails to distinguish aesthetic pleasure from other types of pleasure. As you might expect, regions V1 and V4 are stimulated by many activities, not just art.

One neuro-aesthete even suggests that artists make portraits that look like themselves thanks to mirror neurons influencing the movement of their hands. If this were true, Tallis remarks, it would be a mystery how a male artist could portray a woman, an old artist a young person, or a human artist a tree or a rock.

To understand what art is *for* we must turn to evolutionary theory. Accordingly, art must provide some survival benefit for the species. One intellectual asserts that we like paintings of landscapes because such landscapes (in which we could hunt and gather effectively) helped us survive during the Pleistocene era (between 10,000 and 1.6 million years ago). If this were even remotely true, it completely fails to explain how art has evolved over recent human history. It also tells us nothing about the contributions of individual artists or why we like some artists’ landscapes and dislike others’, i.e. what makes a painting good, mediocre, or bad.

As for *why* artists create art, Darwinitis has an answer for this too; good art acts like the peacock’s tail, indicating the genetic supremacy of the artist. Art apparently plays a key role in sexual selection allowing the artist to propel his or her genes into the next generation more successfully. Unfortunately, not only does this completely ignore the non-biological factors that drive artists (they have been deluded by their brains, you see), it ignores the uncomfortable fact that very few artists are actually successful in their lifetimes.

*Literature*

All of the above arguments apply equally well to the field of literature as well. Tallis asserts that neuromania “addresses the most complex and rich of human discourses, not with an attention that aims to reflect, or at least respect, that complexity and richness, but with a simplifying discourse whose elements are blobs of the brain (and usually the same blobs) wheeled out time after time.”

As a specific example, Tallis talks about some of Shakespeare’s works, which have been analysed for their effects on the brain. It has been suggested that our enjoyment when the bard uses a noun as a verb or an adverb as a noun (e.g. “he godded me”) was due to heightened brain activity. The findings (neural activity) suggested that the brain knew what the word meant (there was no change in the brain wave associated with semantic processing) before it understood its function (there was an increase in the brain wave which registers syntactic violations) in the sentence, forcing the brain to work backwards to fully understand what Shakespeare was trying to say.

Plausible, right? Wrong. Speech marked by grammatical mistakes due to incompetence would have exactly the same effect but I doubt such writing will be studied by future generations of budding playwrights. Second, Tallis points out that it is far too early to be making claims like this considering that we don’t know how to interpret changes in the p600 wave (the one related to semantic processing) and there are many other occasions which lead to p600 being altered. Third, not every grammatical anomaly would generate the same level of interest. Only those instances where there was especial meaning in the sentence would do so. Fourth, a line containing this grammatical ‘flourish’ only makes sense in the context of the unfolding plot, the development of the characters, the way the play illustrates human life, etc. As with everything else we have seen thus far, isolating a thing from its wider context strips it of all meaning and renders it… well, meaningless. And then it doesn’t really matter what happens in the brain.

And again, if Shakespeare arouses reactions that are neurological universals, why does everyone not love his work in the same way? And what is the difference between the pleasure we get from reading Shakespeare (with his grammatical anomalies) and great writing that *is* grammatically correct?

So, *why* do writers write? Evolutionary theory to the rescue. Storytelling has “sharpened social cognition, encouraged cooperation, and fostered creativity.” This may be true, but everything that has come before is nothing if not one long argument against the idea that people are merely being manipulated by the strings of natural selection without their conscious awareness. In addition, this Darwinitic analysis tells us absolutely nothing about what separates great writing from poor writing. It seems unlikely that more sophisticated literature somehow contributes to our chances of survival. Worse still, an organism that spent its time immersed in great literary tomes would end up *less* suited for the challenges of everyday life.

*Law*

Neuromania also has repercussions in the courts. If the neuromaniacs are right, no criminal is truly responsible for his or her actions. They are helpless victims of their brains, and their actions are no more under their control than seizures are under the control of the epileptics who suffer them. Now by itself, this obviously isn’t evidence against neuromania but the fact that people don’t usually deny responsibility for the good (or neutral) things they do already gives us strong grounds for thinking something suspicious is going on here.

Nevertheless, Tallis reports that “neuro-lawyers” are jumping on the neuromania bandwagon and looking for brain activity that allows the defence, “my client didn’t do it; his brain did.” This is easier to demonstrate than you might think. All you have to do is get a brain scan that shows the balance between the potential for impulsiveness and aggression from your amygdala and the control of this by your orbito-frontal region, is sub-par.

Naturally, Tallis has some problems with this. First, we have already seen the huge problems inherent in data obtained from brain scans. Second, for brain activity to be judged ‘abnormal’ we need a ‘normal’ benchmark and there has been very little work done to establish this. Third, the American Psychological Association has reported that the areas of the adolescent brain responsible for risk assessment, impulse control and high-level cognition are all under-developed while the areas from which violence and impulsivity originate are *over­*-developed. All things being equal, this should result in diminished responsibility for violent teenagers… but it doesn’t. Why? Not all teenagers commit serious crimes. In other words; their brains *didn’t* make them do it. Something else is keeping the ‘good’ teenagers (who still have those imbalances in their brains, remember) from acting like hoodlums. Fourth, there are clear examples of people *truly* losing control over their actions due to a brain problem (as in someone suffering an epileptic seizure). These exceptional cases underline the stark differences between those situations where the brain is truly to blame and when it is not; as in the case of a criminal who planned and carried out a crime with full conscious awareness of his or her actions. We also see something similar in situations where we get “blind drunk” and don’t remember what we did. Surely there is an even stronger case to be made that we ought not to be held responsible for these actions, isn’t there? Well, it may be true that after your twentieth beer you were no longer consciously in control, but it was you who decided to keep trucking on past your fifteenth. It was also you who allowed yourself to get into the habit of drinking too much on weekends. This leads into Tallis’ fifth argument; even if a brain scan shows abnormal activity in your amygdala, how do we know this was something you were born with and wasn’t just the result of your poor habits and lifestyle, actions you carried out while fully conscious. Sixth, if we are going to be consistent in blaming inert matter for our actions, why not blame the sugar and the yeast in the alcohol for what it did to your brain? And why stop there? If it’s true that your brain made you do it, it’s equally valid for you to argue that *the Big Bang made you do it*. Tallis offers one last riposte; this one an unintended negative consequence for the ‘innocent’ defendant who was at the mercy of his wicked brain. If you really aren’t responsible for your actions, then it is quite probable that you will continue to break the law (unless you get a brain transplant), in which case it might be prudent for a judge to consider an even harsher penalty. There is a good argument to be made for you to be locked up for an even longer time than you would under the ‘old’ system, in order to keep everyone else (those with ‘normal’ brains) safe.

*Ethics*

It has been claimed that “while the left brain specialises in what *is*, the right brain records what *ought* to be – or deviations within what-is from what-ought-to-be.” Tallis rejects this. The is-ought distinction belongs to that community of minds we discussed earlier, the world of “Thatter”, rather than a piece of matter.

Neuro-evolutionary enthusiasts argue that ethics is not about treating others as you would have them treat you or acting from a sense of common decency, rather it is nothing more than our genes maximising fitness via group selection. Tallis’ arguments? First, the experiments that demonstrate this are, as we have already seen plenty of examples of, outrageously simplistic. Second, if ethical behaviour amounted to programmed behaviour, there is no way we should ever be able to formulate ethical maxims or argue over them. The precept, “treat others as you would have them treat you” would be completely redundant if it were nothing more than a survival mechanism that had been automatically selected for. It would either work or it wouldn’t. At the very least, it seems odd for *un*conscious matter to feel the need to justify and argue for what has been *un*consciously selected. Third, evolutionary ethics fails to explain the ethical diversity we see across different cultures. In general, Tallis observes that ethics seems even less likely to emerge from matter than consciousness and to be a particularly *in*efficient way of ensuring reproductive success.

*Politics / Economics*

Among some politicians there is a desire to bring the latest neuroscience findings into their field and use them to help in making policy decisions. The argument is that neuroscience enables us to peer ‘underneath’ the illusory ‘selves’we *think* we are to develop social policies that go with, rather than against, our nervous systems. No points for spotting the contradiction here. The very fact that we can *voluntarily* adopt social policies in the first place *proves* that we aren’t our brains and that our shared lives are profoundly different from those of animals. If the neuromaniacs were right, this would be impossible because there would be no ‘outside’ from which we could imagine and implement such ‘brain-friendly’ social policies.

How about economics? Why do we rack up so much debt on credit cards? Brain scans have shown that paying by credit card reduces activity in the insula, a brain region associated with negative emotions. This is interesting, but it begs the question how some people (*most* of us, in fact) are able to resist this “hard-wired” tendency to spend money they don’t have. Their brains, like those of the over-spenders operate the same way, after all…

*Religion*

As a prelude to this section I should point out that although Tallis is an unapologetic atheist, he argues against a simplistic, neuromaniac/Darwinitic reduction of religion, not on the grounds that God is real or that the religious impulse points to some supernatural truth, but because he appreciates the value of religion as a historical, *human* invention, i.e. something *we* invented, not our brains.

It has become popular to claim that religious belief exists because it has been selected for by evolution; it is good for social animals, promoting solidarity and cooperation. It is also naturally supported by the operation of our brain, which automatically draws inferences beyond what it can experience, to provide us (it?) with a coherent picture of the world.

Tallis points out that we hardly need fMRI brain scans to tell us religious notions spring from a belief-forming tendency and seek to provide meaning. More importantly though, brain scans don’t actually tell us anything about *how* we come up with the highly abstract and conceptual concepts inherent in religion.

Recently, it has been claimed that there is a “God spot” in the brain responsible for our tendencies towards religious belief. The neuroscientist, Vilayanur Ramachandran, came to this conclusion after discovering that people who had seizures affecting their frontal lobes sometimes reported intense mystical experiences. Another neuroscientist performed fMRI scans on nuns while they were recalling the moment they had experienced the most profound connection with God, in order to find the areas in the brain correlated to religion. This experiment resulted in a somewhat diffuse result; “more like a rash than a single spot”, Tallis reports.

So what is wrong with all of this? First, there is a world of difference between the memory of a religious experience and actually translating this experience into a religious worldview. Religion is far more than a single mystical experience; it is a carefully formulated body of doctrines, prescriptions for behaviour, customs, etc. To achieve all of this, we need more than a single, isolated brain operating independently of anything else. It needs that “community of minds” once more, a world that extends beyond a single brain. Second, someone who imagines that religions emerge from our biology has to ignore the fact that they are *argued* into place. Religious disputes certainly don’t look like anything that happens in the natural world. (Evolution doesn’t convene councils and argue about whether to go ahead with some proposed changes) In addition, religious belief is only capable for a creature that is aware of the fact that it will die. This includes all of those features we discussed earlier that make humans conscious and self-aware (intentionality, a sense of tensed time, etc.). If we were just another animal, religion would be the last thing on our minds (assuming we even had such things).

Conclusion

The philosopher John Gray mocks the “faith” modern humans have that we can rise above other animals and come to know the truth. He argues that if Darwin’s theory is true, then our minds serve evolutionary success, not truth. Isn’t it odd then that Gray seems to be the only one among us to have somehow risen above his lowly animal nature and grasped this truth; a truth which eludes the rest of us by our very natures? And what’s more, he blatantly refutes his own claims by relying on a scientific position (not to mention an entire tradition of scientific and rational thought) that, since it was inspired by animals with brains wired for evolutionary success, itself has no claim to truth.

In fact, the whole discipline of cognitive neuroscience stands as a testament to the *community of minds* that transcends the brain and allows us to look at it from a unique position ‘outside’ it. It is only because we can step back from matter, that we are able to make it an object of thought and thereby develop a science about it. We are finding right now, as much of Tallis’ book testifies to, that we cannot stand outside consciousness in the same way.

In his conclusion, Tallis issues a call to action to those in the humanities, particularly the philosophers, whom he thinks ought to stand up and resist the hostile takeover they are currently facing from the natural sciences. He particularly laments the fact that philosophers haven’t done more to assert their authority, but have instead rolled over and even welcomed the invaders into their camp by imitating their methods through so-called “experimental philosophy”, a practice Tallis calls a “striking example of self-loathing in philosophy.” Experimental philosophy is most well-known for devising experiments which involve scanning the brains of people as they think about ethical issues.

Needless to say, this completely misses the point of moral philosophy and the famous thought experiments it produces. Ethics is a *normative* activity, that is, one concerned with standards or norms, especially of behaviour. Thought experiments, often criticised as being meaningless, particularly when approached from a scientific perspective, are valuable because they make our moral assumptions, intuitions and beliefs *visible* so they can be examined, disputed or defended. By contrast, identifying which parts of a person’s brain are active when they are thinking about moral problems is a *descriptive* activity and tells us absolutely nothing about morality.

*Looking Ahead*

Acknowledging that his book has mainly been negative in nature, Tallis dedicates the closing pages to where we might go from here. He identifies three mysteries that loom large in our current understanding:

1. How it is that material things have no appearances in themselves and yet somehow *appear* to certain entities (us).
2. How these appearances are organised and synthesised into a coherent world.
3. How we are able to make progress in our ability to comprehend the world.

He also suggests three ways we might try to solve these problems, from the least to the most radical:

1. Look beyond the brain but keep it at the centre of our enquiry.
2. Question materialism by looking critically at the notion of matter.
3. Deny the privileged connection between brain and mind and consider the idea that mind may be more widely, perhaps even universally, distributed.

The problem with the first method is that it remains reliant on a material object – the brain – to be “about” events other than itself, and out of that “aboutness” to somehow create a world that its owner can participate in.

The second method comes alive in the theories of quantum mechanics which has certainly given the universe more life than Newton’s mechanical, “push-pull” description did. There is also something promising about the fact that a key principle in quantum mechanics is “the observer lies at the heart of matter.” One problem with this approach is that quantum mechanics applies to *all* matter; not just that associated with our minds. A second problem is that while appearance seems to be located in the heart of matter, it requires an observer to bring it out. In other words, quantum mechanics *presupposes* an observer, the very thing we are trying to explain.

The third approach leads to *panpsychism*, the belief that mind is present throughout the entire universe. The guiding intuition here is that if everything in the universe is made of the same stuff and there is no satisfactory explanation of how consciousness arises from a consciousness-free world, then maybe consciousness is present in everything to start with. The problem with this approach is that if *everything* is conscious, why is it then that only some things seem to be?

In closing, Tallis urges us to recognise the limitations of a physics-based materialism; limitations which preclude it from giving us answers to the questions we have concerning consciousness. However, in everything he has talked about (and there has been a lot) there is one concept that he sees as being fundamental to consciousness and which he favours as perhaps holding the key to a full understanding; namely, intentionality.

As we have seen, intentionality somehow manages to buck the causal chain and reach back up it, projecting itself outwards into the external world and casting its conscious eye on everything it perceives. It is this feature of consciousness that Tallis feels we are least able to fit into the materialist world picture as it currently stands and if a solution is waiting to be found, it is here that he feels we ought to invest more time and energy looking for it.