

Snap Thoughts

Snapshots of my mind

by
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INTRODUCTION

As the relentless spearhead of Time nudged me deeper into my seventh decade on this planet, I naturally found myself increasingly contemplating my mortality. I felt a burning desire to take stock of my life... but not so much of the things I've done in that life, however. I found myself more interested in the things that I have thought about, the ideas I have had and the conclusions I have reached over those decades.

I have always enjoyed discussing these thoughts with others, challenging any ideas (of my own and of others) that stumble into the realm of opinion or otherwise stray from the rigours of reason. I mostly try to seek the evidence behind any belief or assertion. I am always fascinated at the diversity of pathways that lead to what people consider to be true, holding that the more radical the belief the stronger needs to be the evidence for it. In numerous such discussions it has become increasingly obvious that many of my own thoughts are seen by many to be somewhat unconventional, even weird...

It is the purpose of this book to present some of these thoughts - weird or otherwise. As such it is an attempt to summarise sixty-odd years of observation, discussion and questioning. As a summary, then, I don't intend to convey every step taken to reach a particular conclusion or view. Imagine, then, that these chapters represent a cross-section through my mind at this point in my life... a snapshot of where my thoughts are at in 2013. And just as photographs taken on a holiday show much more about where you are at those particular points in time, only hinting at how you got there, so will these snapshots of my thoughts - my SnapThoughts - emphasise my conclusions more than the intellectual journey that led to them.

GOD and RELIGION

I, like every other baby, was born without any specific belief in any specific god. I was, therefore, born an Atheist. My parents, however, raised me as a Catholic. I diligently went to Church every Sunday. I confessed my sins before I could take Communion. I went to Catholic schools, where I was taught by Nuns and Brothers. I even considered a life as a Priest. At the age of eighteen, however, I soon discovered that all this stuff about God was nothing more than the wishful imaginings of people ill-equipped with the tools for discovering how the Universe really works.

Ever since then I have considered myself a “born-again Atheist”. (Actually there should not even be the need for such a term as “Atheist”... people who don’t believe in fairies aren’t labelled Afairyists. Those who don’t believe in Santa Claus aren’t called Asantists... but that’s an argument for another day...)

Ever since then I have not encountered one iota of evidence that could lead me to conclude that a god (or gods) really exists... or that anything “supernatural” (angels, heaven, hell, souls, spirits, afterlife...) exists either.

It’s not as if I didn’t try looking for such evidence... soon after losing my Catholic faith I often found myself praying that God would reveal himself to me in some convincing way. This revelation, of course, never happened... my heartfelt pleas merely dissolved into the darkness of my room. I even thought that maybe I was trying to talk to the “wrong” god... and started delving into the teachings of other Christian religions, and even tentatively explored the tenets of Buddhism.

Around this time I was also immersing myself deeper into the philosophy and the discoveries of Science. I was learning how virtually everything around me - from the way the Universe works to the reason humans look, behave and think the way they do - can be explained without the need for supernatural intervention... and that the discipline of the Scientific Method was the most reasonable way of discovering these explanations. In fact, it became increasingly obvious that the Universe appeared to behave in EXACTLY the way you would expect it to behave if it were NOT designed by a supernatural entity, and was ruled entirely by physical laws, most of which were well known to science.

All this fruitless religious exploration, contrasting with the vivid enlightenment offered by my burgeoning naturalistic perspective merely reinforced my growing conviction that Faith and Reason were poles apart... that the “way to God” so fervently followed by my religious friends (Faith) was not only incompatible with Reason, but that it was the antithesis of Reason... which was a real problem to a Catholic eighteen-year-old who nevertheless desired to live a rational life.

For those eighteen years I had been so inculcated into accepting the reality of this particular God that I was fearful that casting those beliefs aside would have enormous repercussions. In fact, that was not the case. Aside from a slightly obsessive desire to analyse and try to understand the myriad of supernatural beliefs that purport to guide people through their lives, I have not once regretted “losing my religion”. In fact I feel very comfortable in my Atheism. It allows me to more reliably observe and make life-decisions without the prejudice that necessarily accompanies Faith. It offers me an objectivism that dovetails perfectly with the rationalist philosophy which I employ to guide other aspects of my life. But mostly it gives me the freedom to weigh evidence before arriving at a conclusion... where Faith appears to require you to do exactly the opposite!

Once a person finds themselves committed to a particular religion they will go to enormous lengths to fit their observations of the world into that particular doctrine... “The Bible is the word of God, so it must be right”. Never mind the hundreds of years of scientific discovery that presents a very different view of the Universe and our place in it, the Bible can’t be wrong! While I can understand the psychology behind why people will go to such lengths to deny the accumulation of contrary evidence, I think that such blind adherence to the authority of an imagined deity to be so anti-intellectual as to be an abuse of the powers of reason that our remarkable brains give us.

Obviously I am “committed” to a rational world-view. But this commitment is vastly different from a commitment based on Faith. A rational world-view is self-correcting... it is based on evidence, and as the evidence accumulates and gets more accurate it sometimes challenges the reality of a particular view... which then needs to change to match the evidence. This is the crux of the scientific method. Of course, it rarely happens as neatly as this. Science is done by scientists - and scientists are human, suffering the same psychological needs and social pressures as all other humans. They hold onto old views probably longer than they should as contrary evidence piles up around them. But the principle remains. Rationalism is NOT a faith. It is a self-correcting world-view that accepts what the evidence tells, and is able to change as the evidence accumulates.

This emphasis on evidence is the cornerstone of the scientific method, and it is no coincidence that as my exposure to the philosophy and methodology of science increased, my belief in the supernatural decreased. The process of science matched perfectly my desire to rationally describe the way the world worked. Science gave me the tools to explore and explain the complexities of everything from how atoms are put together to the way the Universe has evolved... and how we are part of that evolution. I found myself willingly embracing the cyclical methodology of observation, hypothesis formation, testing and reformulating the hypothesis that

lies at the heart of science. And this methodology yielded many more answers (and asked a lot more questions) than any religious holy book ever could.

The scientific evidence defining how the world really works tells me quite clearly that gods and all the related “supernatural” phenomena that goes with them, are purely an invention of humankind, invented to explain stuff they couldn’t otherwise make sense of. Humans seem to be hardwired to see patterns in things... we see faces in burnt toast; we see causal connections where there is merely coincidence; we see meaning where there is none. This can be thought of as an evolutionary advantage when needing to communicate complex data... describing the pattern is much more efficient than describing the complexities behind it. And the most “efficient” pattern of all is to accept that something is the way it is because God made it that way. End of story. Believing this, however, removes the incentive to explore further. It “externalises” the sense of responsibility for finding out more. And, once people imagined that these gods can be manipulated through sacrifice, prayer and offerings they were able to exploit the gullibility of others. Entire empires have been based on an elite few monopolising the channels to the gods, using that power to control the masses... hence, religions were invented where guilt and the threat of vengeful gods were enough to get people to do almost anything to save that other imaginary invention... their eternal soul.

Obviously I don’t “believe” in souls. Or in life after death. The rapidly accumulating evidence convinces me that I am entirely made of chemicals and what goes on within me is entirely chemical, subject to the same laws of physics that appear to literally be Universal. Obviously most of this chemistry is very complex - and nowhere is this complexity more apparent than in my brain. It is in my brain that the ability to see “patterns” is paramount. The brain is all about connections. Some of these connections are hardwired. Most, however, are formed as we experience life - as we learn. In the human brain there are numerous “meta-connections” - where patterns of connections are themselves connected to other patterns of connections. We call the resultant process “self-awareness”. But it is still just complex chemistry. Before we knew this, however, we had words like “soul” or “spirit” to summarise these feelings of being somehow separate from our physical body.

This same complex brain is able to foresee our own mortality and this is not a pleasant vision. Most religions were able to exploit both this fear and the meta-connectedness inside our brain to propose not only a “soul” that lives within our bodies, but which can continue to live forever after we die. What an enticing thought. It wasn’t hard to sell! And no-one has ever come back from the dead demanding a refund for being misled! Furthermore this promise of eternal life could be exploited even more by offering an eternal reward for those who live as we tell you to live, or eternal punishment if you disobey our rules. Talk about the ultimate carrot and stick! The

stakes were just so high that for thousands of years people blindly believed whatever religion was in fashion at the time (and there have been thousands of these).

As we learnt more about the way our brains work the accumulating evidence kept reinforcing that there is no need to hypothesise anything beyond the complex connections that exist in physical reality inside our heads. There is no need for a soul, a spirit, a universal consciousness, or whatever. God, like Santa Claus, is an invention that once served a purpose but now we know more about the processes that gave rise to this invention, isn't it time to discard it and all the trappings that lead to the exploitation of those too afraid not to believe?

I imagine a world without religion, where each of us takes responsibility for their own finite life... recognising that this is really all there is. There is no-one or nothing else to blame. When my body dies my brain dies... which means I cease to be. Just like "I" was for the 13.7 billion years before I was born, so "I" will be for the billions of years into the future. The only things that will live on beyond my death are the products of those complex brain connections... the writings, the photographs, the changes in the brains of others (memories). Once we realise this, surely we'll be more likely to treat the planet - and others - more kindly?

MORALITY

“In a world without god, where will we turn to find moral guidance?”

In its myriad forms, this question has arisen whenever I express my preference for an atheistic, rationalist world. My answer is twofold. Firstly, from which of the thousands of gods should we receive our moral guidance? And secondly, what would a social/moral system look like without such divine guidance?

Concerning the first response... since gods are an invention of humans, their natures and “guidance” appears to reflect the mores of those who invented them. Different gods, then, provide different moral guidance. Some advocate bloodshed, others peace. Some encourage sacrifice, others prayer. Some require lifelong devotion, others are content with Sunday morning lip service. Most seem to be male, and frequently misogynistic. Renowned skeptic James Randi has analysed the Christian Bible, searching for examples of “moral guidance” demonstrated by that particular god. He concludes that this god is clearly “bigoted, capricious, cruel, deceitful, genocidal, homophobic, insecure, intolerant, irrational, jealous, malevolent, vindictive, misogynistic, racist and violent... A bully that demands constant praise, sacrifice, adulation and ego support or the penalties can be very severe”... not exactly the kind of example you’d want to follow as a guide to one’s moral code!

So, if I am to accept a particular god as my moral guide, I need to choose between this improbable pantheon of gods. For most religious people, this “choice” is usually made for them by their parents even before they are born, meaning that is not much of an informed choice at all.

But the difficulties don’t stop once that choice has been made... the rules for living a “moral” life are usually recorded in folklore or, more permanently, written in holy books whose authorship can even be attributed directly to God. Thus we can find ourselves struggling to find solutions to modern moral dilemmas in multi-translated books written hundreds, even thousands, of years ago. Naturally such re-interpretation sees the need for specialist priests, rabbis, imams, gurus, etc to extract the required guidance from the often ambiguous and contradictory - but nevertheless dogmatic - holy scriptures.

Why would any rational person even contemplate seeking “moral truths” from some ancient book written by several authors hundreds of years ago telling stories of and to people whose lives were so different from the lives we live today? And yet people go to great lengths to cherry-pick advice from such books (happily ignoring or “interpreting” the bits that don’t seem to fit their specific circumstance). Their reasoning is, of course, circular... this book tells me it is the word of god, so everything it says must be the word of god, including the fact that it is the word of god. Until that circularity is broken this kind of argument will continue to suck the gullible into its

vortex of irrelevance, preventing them from seeking rational solutions to their modern personal and social dilemmas.

Which brings us to the second point... can reason alone provide us with moral guidance once our moral compass is wrested from us as we wean ourselves from the authority of the gods? Of course it can. When I relinquished my Catholic faith I didn't suddenly become a murderous rapist. Why not? Because I am a product of millions of years of evolution. And as a member of a particularly social species, *Homo sapiens*, my behaviour has been shaped by Natural Selection so the balance between self-interest and communal interest has long ago been selected to optimise the survival of my species... just as it has with all other social animals. In other words, much of the hardwiring of our human brain leads us to experience empathy for our fellow humans... "Do unto others as you would have them do unto you" is not a rule handed down from on high. It is hardwired into all of us because it has allowed us, as a social species, to survive. Furthermore, our complex brains allow us to predict, to a certain extent, the short and long term results of our behaviour, allowing us to "imagine" outcomes of a particular behaviour without actually having to do it... and our gift of language allows us to talk-through these outcomes, avoiding conflict, for example, before it even begins.

So, combine the evolutionary hardwiring of a social species for cooperation and empathy with a brain capable of predicting the results of behaviour and our ability to communicate potential outcomes before they happen and you have the basis of a civilised social system without any need for divine guidance.

So where does "reason" enter this picture? Reason - and the scientific approach that follows from its application - frees us from the shackles of divine prescription. It allows us to explore the things that make us human. It turns the revealing light of Science on our origins and behaviour. We have learnt more about ourselves through a century of scientific investigation than has ever been revealed in any holy book. We have learnt that it was our ability to cooperate and share that enabled our species to survive African drought and Siberian ice age. We have learnt that the cooperative nature of trade has done more to shape our history than the more spectacular acts of war. We have learnt that we share much in common with other species - especially social species - than has even been admitted in the mostly homo-centric holy scriptures.

And with this explosion of knowledge has come a much better understanding of what moral values are more likely to lead to social stability. And for the benefit of those individuals who lack or ignore this understanding, we make and enforce laws. We make them not because they were written in stone three thousand years ago by some imaginary divine hand, but because reason tells us that they are necessary for society to function.

Alain de Botton is an Atheist philosopher renowned for being “gentler” than the more confrontational Atheists that perhaps attract greater notoriety (and antagonism). He recently published his own version of the Ten Commandments which he bases on the same sort of rational principles I’ve outlined here... sort of a 21st-century guide to a pleasant coexistence. He call it his “List for Life”. I find them so compellingly sensible and unarguable that I am happy to repeat them here:

I. Resilience: Keeping going even when things are looking dark.

II. Empathy: The capacity to connect imaginatively with the sufferings and unique experiences of another person.

III. Patience: We should grow calmer and more forgiving by being more realistic about how things actually happen.

IV. Sacrifice: We won't ever manage to raise a family, love someone else or save the planet if we don't keep up with the art of sacrifice.

V. Politeness: Politeness is closely linked to tolerance, -the capacity to live alongside people whom one will never agree with, but at the same time, cannot avoid.

VI. Humour: Like anger, humour springs from disappointment, but it is disappointment optimally channelled.

VII. Self-awareness: To know oneself is to try not to blame others for one's troubles and moods; to have a sense of what's going on inside oneself, and what actually belongs to the world.

VIII. Forgiveness: It's recognising that living with others is not possible without excusing errors.

IX. Hope: Pessimism is not necessarily deep, nor optimism shallow.

X. Confidence: Confidence is not arrogance - rather, it is based on a constant awareness of how short life is and how little we will ultimately lose from risking everything.

Note how we are motivated to follow these precepts not by fear of eternal damnation or of displeasing some vengeful god, but by our shared desire to live in a predictable, peaceful and mutually rewarding society.

Clearly religions don't have a monopoly on morality, even though they like to think they do.

One final thought is worth expressing at this point... It is a thought that struck me while I was deep in conversation with a Jehova's Witness who was trying to convince me that ALL moral teaching stems from the tattered Bible that he would wave manically before me, as if anointing me with its sanctifying contents. My thought is this... how does such a religious person actually judge the worthiness of a biblical command, such as "love thy neighbour as thyself"? I mean, he reads that phrase in his book then somehow "knows" that it is right. But how does he know that this moral guidance is right? Similarly, he reads a divine command that tells him it's wrong to kill. Again, he instinctively "knows" that this is morally sound. But how does he know this?

To my mind he behaves as if there was some internal "moral compass" that he uses to judge the worthiness of his Biblical commands. It's as if he was not actually using his Bible as a source for moral behaviour but as validation for his own internal moral compass. Perhaps this is seen more clearly in the Biblical commands that my Jehova's Witness friend chooses NOT to follow. For example, I pointed out to him the passage where God commands that an adulterous wife be stoned to death... a command that he clearly has no intention of following. My question, then, was how did he "know" to accept certain Biblical commands and ignore others? Of course, this question is most easily answered if we accept the proposal that we all have within us a highly evolved sense of right and wrong, guiding our moral decision making. My friend's sense of morality, then, would come not from the Bible, but from his internal moral compass guiding him to cherry-pick those Biblical instructions that tend to validate his innate sense of what is right and what is wrong.

The same as godless me!

MEANING

“How devoid of meaning must be your life”. So say my religious friends as they struggle to understand my “godless” life. How wrong they are. Having liberated myself from the constraints of having to extract “meaning” from the confusion of messages contained in whatever holy scripture was thrust at me I am free to attach meaning (or not) to everything I do. The difference is that this is a meaning of my own choice, not imposed by some imagined authority.

Of course evolution is blind... there appears to be no ultimate goal. Natural Selection merely weeds out those combinations of chemicals whose conformation is less advantageous than others. On our little planet the blueprints for these chemical conformations is contained in another chemical, DNA. In a sense, then, you could argue that the “purpose” of life is to maximise DNA’s chance to survive through designing particular chemical conformations (bodies) that facilitate the replication of DNA.

This, however, misses the point of “meaning”. This same DNA has, through millions of years of Natural Selection, yielded the complex human brain. This brain is capable of imagining cause and effect in advance - of predicting outcomes. It can also extrapolate this causal sequence backwards... of imagining a particular outcome and deciding on a course of action that might lead to that outcome. This is how I attach “meaning” to my life. I decide to do (or not do) something because it will take me closer to my imagined future state. This may be as simple as choosing to eat breakfast to prevent my feeling hungry later that day. Or it may be as significant as choosing to live a “good life” because that’s the way I’d like others to react to me. Or it may extend to continuing my lifelong passion in wanting to understand how the world really works... an innate curiosity shared, thankfully, by many others despite the attempts of religious dogma to stifle it. In all of these ways my life, far from being devoid of meaning, is awash with innumerable meanings. And the same should be true for everyone... each can attach to their life a matrix of meanings, the makeup of which is decided by THEM.

Of course my religious friends are really talking about some “ultimate” meaning... some sense that by following the rules of their particular religion they will somehow satisfy the often impenetrable reasons of their imagined deity and be rewarded with eternal bliss. And many religions even pride themselves in the fact that the “real meaning” behind their acknowledged blind faith remains unknowable... they seem content to believe in the “mysterious ways” of their god, while all they need to do is to follow their particular interpretation of the “rules”. For me, all this is a sad distraction... it sets your gaze way too far into an imagined future, beyond death, preventing you from focussing on the life you have here and now. For me, the realisation that this little window of consciousness - my lifespan - is all there is. Once it’s over the chemical conformation that was “me” at the time of my death degrades into its constituent bits and re-mixes with the rest of the stardust from which we are all made. My state of existence becomes no

different from the state it was before my mother's DNA combined with my Father's DNA to yield the blueprint that shuffled those chemicals into becoming me.

In fact, it is interesting to note that there is not a single molecule in your adult body that was there when you were born. And the same is true of the cells. Most of "you" has already returned to the Earth, only passing through you as part of its eternal recycling. In a sense, all those tonnes of matter that had once been part of you will already be "dead" and returned to Earth long before you die. What remains to define "you", of course, are the connections in your brain that define your thoughts and your personality. It is only when these connections cease to be that "you" cease to be.

However, although I am certain that no part of my consciousness will live on beyond my death, just as it was non-existent before my conception, I am very aware that artifacts (such as these writings) and memories will live on in other people's brains for at least a short while, and I'd like to think that I would be remembered as a "good person". This is the closest an Atheist can get to "life after death". For me this is enough to give capital-M "Meaning" to that life. But this desire is merely another of the multiple meanings, big and small, which fill my days.

A friend of mine often says that all you need in life, once your basic needs for food and shelter are met, is "a project, someone to love and someone to love you". Another friend describes his "purpose" as "just filling in the time between birth and death". Like me, they wake up every morning with a (usually unspoken) list of things to do... and, even though it may rarely be so expressed, reasons for doing each thing on the list. Some of these reasons are immediate, others are life-long. Some may even be considering their impact after they die. Our godless lives are chock-full of meanings, without the need for any supernaturally superimposed meaning distracting us from the importance of these.

DEATH

I was dead for 13.7 billion years before I was conceived. I will live for a few decades before I will be similarly dead for the rest of time. I had no awareness of that first period of death, just as I will have no awareness of the second. The only period in this infinite sea of space and time where I have any awareness is this microscopically small window of my lifetime. Small it may be, but to me it is so indescribably precious. Similarly, you and I are effectively “dead” for a significant part of each day. Apart from a vague recollection of the odd dream, most of the time I am asleep I am effectively dead. The only difference between deep sleep and really being dead is that most times I’ll wake up... even though I am not aware of this possibility while asleep. Similarly, from my own point-of-view I am effectively dead every time I undergo anaesthesia for an operation. If I were to really die during the operation there is nothing that would alert me to that fact... to me the two states, anaesthesia and death, are indistinguishable. I therefore have no fear of being dead - after all I’ve been there before. But just as I hate walking out on a movie before it’s finished, I would prefer to remain alive as long as possible.

But by “alive” I mean conscious and aware of my own existence. Once this awareness is gone... even though my body may well be able to be kept functioning... I would certainly have no objection on having my life-window closed as gently as possible. Yes, I’m referring to the unnecessarily contentious issue of voluntary euthanasia.

It is unnecessarily contentious because it has been hijacked by those religious people who contend that “only God” has the right to decide on the timing of one’s death. Of course, these same people (apart from a few extremists) seem to have no compunction about accepting all that medical science can offer to delay God’s timing, extending their life spans well beyond the thirty to forty years that was the norm before science taught us about the real origins of illness. But they insist on leaving the timing of one’s death up to a god who, let’s face it, must get his kicks out of watching the drawn-out suffering of millions of people as they painfully approach their last breath.

Although I would much prefer a world without religious adherence to the ancient ramblings of imaginary deities, I concede that there will always be people gullible enough to believe anything. If they choose to believe that they have to suffer whatever pain or indignity precedes their own death, then so be it. All I ask is that they allow me to choose the method and timing of my own... and to seek the assistance of others should I be in a circumstance where I can’t end my life by my own hand.

I can present a similar case for the beginning of life. Again the issue of abortion has become unnecessarily contentious, mainly because it too has been hijacked by religious people trying to tell us how we should live. Once you eliminate the arbitrariness of the infusion of a “soul” into a

human life, then all those arguments about when life begins cease to be meaningful (and the unquestioned acceptance of the "value" of a human life being beyond that of any other living thing becomes rightly open to question). As with the concept of euthanasia, if you define human life by the level of awareness and consciousness, then the issue of abortion becomes much clearer. I don't know about you, but I can hardly remember anything before about the age of two. I certainly can't remember anything from my time in the womb. Neurologically, as a foetus I was about as aware as a fish. If I had been aborted it would hardly be any different to me than if that particular sperm had, along with the other millions of "losers", never penetrated that particular egg. And you'd have to be pretty extreme if you were to cry over the loss of potential for each and every one of those sperm.

And it's not as if the planet needs any more humans on it! In fact, because our brains are capable of anticipating the future, we, probably uniquely among all other extant animals, know that we are going to die. It is the dread of this pending finality that motivates us, no doubt, to invent "souls" that live on after we die. And yet evolution requires that we, and every other living thing, must die. Just imagine the calamity that would ensue if the search for an elixir of youth were ever actually found. In the blink of an evolutionary eye the planet would be even more awash with humanity than it already is. We would be crushed together, uncomfortably rubbing our eternally youthful shoulders... and our DNA would have fewer chances to renew and evolve... thus making such a scenario an evolutionary dead-end. Death is necessary for the evolution of life.

In fact, from the viewpoint of our DNA, living beyond the age where we can give birth to and raise the next generation is a waste of resources... that's why we are programmed to start deteriorating around middle-age. Because, as I have reasoned in a previous discussion, we don't have to accept the compulsion of our DNA, now that science has revealed its workings. And because we can create our own "meanings" for our own existence, I certainly am not advocating mass euthanasia once our parenting phase is over. I only advocate freedom of choice... where it is up to each individual to decide when and how they are to die. That point in time may be defined by their perceived "usefulness" or awareness, the degree of meaningfulness in their life, or even their level of suffering. The point is, it should be entirely up to them.

While on the subject of death... it strikes me as odd how humans place such inordinate value on human life while placing so little on the lives of virtually all other species. I suspect that this has its origins in the scientifically discredited, but still widely held belief that humans are not bound by the same rules as the rest of "Nature". Most religious creation myths are anthropocentric, emphasising humans as the pinnacle of creation or even created separately from other creatures. Science shows us that this is completely wrong. We, along with every other extant organism, occupy the tip of one of many millions of branches on the evolutionary tree. Remove the

imagined human soul and we can be viewed as just another animal. This is a powerful vision which not only knocks us off our self-aggrandising perch, but elevates the rest of the natural world to demand similar respect.

Of course, “respect” doesn’t mean that we shouldn’t kill. There are circumstances when killing other animals is entirely, and rationally, justified. The obvious one is hunger. All carnivores and omnivores kill for food. Even herbivores kill plants. Which all makes perfect evolutionary sense... just as with the elixir of youth analogy, if predators were to disappear we would very soon be overrun with their prey. By viewing human life in this evolutionary context, we can rationally imagine circumstances where killing is similarly justified. Euthanasia is one. Abortion is another - even if we don’t accept the concept of “consciousness” defining life, there can still be arguments made that while the foetus is part of the mother’s body it should be her choice whether it lives or dies.

POPULATION

One of my favourite observations is “humans seem so smart and yet are so stupid”. Nowhere is this smart/stupid paradox more obvious than when it comes to our attitudes to the vast numbers of humans on this planet. As a species we are so smart we have been able to apply the tools of Science to dramatically extend our individual life spans, increase our childhood survival rates and improve our fertility. However, it seems that we have done all this with blinkers on... we appear to be blind to the longer term consequences not only to ourselves, but to the other life forms with whom we share this planet... and to the very climate of the planet itself.

When I was born (1950) there were 2.5 billion people on the planet. There are now (2013) over 7 billion. This phenomenal growth rate of a single species is literally unprecedented. In 1950 the life expectancy for an Australian male was 66. It is now 79. In 1950 one in thirty infants died. Now it is less than one fifth this rate. Much of this growth in the human population can be attributed to modern medical practice, improved sanitation and vast increases in the efficiency of food production. Along with this increase in the number of people we have also witnessed a significant improvement in living standards for many of these.

All this points to how smart we are as a species. Our unwillingness to plan for the consequences of this unprecedented expansion points to our stupidity.

The roots to this paradox lie in our evolution. 150,000 years ago there were probably fewer than 10,000 humans on the whole planet, scattered in small groups around the savannahs of Africa. For thousands of years it was touch-and-go whether the species would survive. One of the characteristics that led to our ultimate triumph against the odds was our innate drive to protect our “band”, and particularly our young. The support of an extended family was essential for this, allowing each woman to maximise her childbearing despite the fact that the size and complexity of the human brain requires a very long gestation and nurturing period. Quite evidently this strategy worked well. We didn’t go extinct, a fate which sadly befell all other hominid species and even our contemporaneous cousins, the Neanderthals.

Up until the 19th Century, when humans began applying the tools of Science to the practice of medicine and began to understand the nature of disease, the number of humans increased only gradually and erratically, despite the large number of children per woman, many of whom died in infancy. Then came the exponential boom. The strategy of having as many children as possible which stood us in good stead for all that time now became a burden, as many more of them survived to breeding age, triggering an unprecedented upswing of the population curve.

In the early 19th Century Thomas Malthus warned of the illogicality of expecting an exponential growth in population to continue indefinitely in a world with finite resources. He was ridiculed

by the powerful industrialists with a vested interest in continuous “growth”, living in an artificial world of their own making where economics was the measuring stick for success, and the environment was deliberately defined as an “externality”.

In the period since Malthus many others (Alvin Toffler, Paul Ehrlich, Tim Flannery, to name just a few) saw the folly of unchecked population growth. Most were relegated to the fringes of acceptance, driven there by the vested interests of a world dominated by the short term greed of Capitalism and the ingrained evolutionary imperative to keep having as many children as possible.

Several island-bound cultures, for whom their finite world was much more obvious than it is for the rest of us, solved this dilemma by infanticide, contraception, warfare and/or forced emigration. For the 7 billion of us trapped on this island called Earth, emigration is not possible. While the least distasteful of the other population control measures is undoubtedly contraception, there exist cultural and religious opposition to even this. So it looks like we are headed for a future where “Nature” will bring our population down to a more sustainable level, with little deliberate intervention by us.

What, exactly, might this mean? Well, if everyone on Earth chose a living standard similar to that enjoyed by middle-class Australians, and we deigned to give over some space to the other species with whom we share this planet, then it has been variously estimated that Earth could effectively sustain only around 2 billion people. We are currently managing to support 7 billion - but only because we are consuming resources much faster than they can be replaced. We are literally living off resources that should be kept for future generations to use. Tim Flannery calls us the “Future Eaters”, a suitably descriptive and appropriate term. Just as there is a mass dying-off of fungi growing in a petri dish when they reach the edges of their dish, so too will there inevitably be a mass dying-off of humans as we reach the limits of our resources. What humans so often fail to realise is that it is not WE who make the rules... the physical limits to growth are as real as is gravity. It is difficult to say when this crunch will come, or what form it will take, but its inevitability is certain.

It may be mass famine. It may be an epidemic of antibiotic-resistant superbugs. It may be we run out of clean water. It may be climate change decreasing the amount of arable land. It may be triggered by a drastic oil shortage. It may even be out-of-control warfare. Most likely it will be some combination of all of these things. Like the Black Death it may happen overnight, or it may creep upon us over decades. My hope is that these impacts will be less devastating if the world adopts something akin to a global one-child policy along with mass contraception, thereby empowering women to control their own reproductive lives, and limiting the numbers of people having to face the inevitable catastrophe. One way or another, though, sometime in the near

future our descendents will have to suffer a devastating decrease in their number by at least 5 billion people. That's five thousand million individuals. And no matter how that pans out, it won't be pretty.

So, even though Blind Freddy can see that infinite growth in a finite world is impossible to sustain, why aren't we doing anything about it? Well, some countries have tried... China, for example, introduced its One-Child Policy, resulting in 350 million fewer mouths to feed. Of course, this good outcome was more than overcome by the huge growth in China's middle classes - giving a net increase in resource consumption regardless of the fewer overall numbers. Most of the rest of the world just blunders along, blissfully unaware that we are consuming the equivalent of four or five Earths worth of resources while living on only one! Or if they are aware of this fact, their leaders seem to lack the courage to do anything about it. Besides, overpopulation is a global issue and our leadership is still shackled by the tribalism born of our evolutionary history - still pretending the world is divided into relatively independent villages, states and countries... each looking after its own interests. I await with bated breath the time when we have an effective global leadership that recognises the real, environmental limits to growth at the global level and can override the parochial, and primarily economic, interests of individuals and countries!

While capitalist economics stubbornly insist that "growth" is the preferred norm, and while politics is dominated by parochialism, big business, economics and popularity, and while the majority of the population is blindly driven by those same evolutionary forces that allowed us to survive 150,000 years ago - and remains blissfully uneducated about the real environmental costs of lifestyle decisions, the number of humans will continue to grow unchecked. It is sad because all this potential for catastrophe is so entirely unnecessary... we could have had a world of 2 billion people living very comfortable lives in the knowledge that their descendents would be similarly comfortable. Of course, that would have been the smart thing to do.

What makes me even more sad is the fact that humans are not only eating their own future, they are impacting almost every other species of animal and plant on the planet. Almost every harmful thing we are doing has an element of overpopulation associated with it. Wars of the future will be increasingly about living space or other irreplaceable resources such as water, agricultural land or oil... and they will only get more desperate as the resource becomes more scarce. The levels of pollution will only increase as the planet, viewed as an infinitely big garbage bin for thousands of years, actually fills up with that garbage. And of course, the more people there are consuming fossil fuels, the more carbon dioxide is released into the atmosphere, trapping more heat, raising global temperatures, threatening whole ecosystems, acidifying the oceans, increasing weather variability and raising sea levels. And the fact that the third greatest extinction event in Earth's history coincides with the largest human population size is, of course,

no mere coincidence. The list could go on and on, but the question needs to be asked... why? Why do we need to risk the fragility of life on earth merely to satisfy some ancient urge, an urge fuelled by the illogical capitalist doctrine of continued growth and individual greed?

Maybe because we are stupid after all, and probably deserve to wipe ourselves out. I only wish we weren't going to take much of the rest of the life on the planet with us!

Before leaving the topic of population, just a few more thoughts on the contentious role of medicine... I heard recently the breathless pronouncements that Bill Gates had thrown so much money at the problem of Malaria that it should shortly be all but eradicated - just as Polio and Smallpox before it have succumbed to the weaponry of modern medicine. The rest of the world greeted this pronouncement with undisguised enthusiasm. "Millions now saved from death" shouted the headlines. My response, I must confess, was far less enthusiastic. While as a fellow human being I felt joy for the individuals who would no longer need to suffer the misery of malaria, I metaphorically slumped my shoulders in despair at the thought that those "millions saved" would really just take us ever closer to the overpopulation precipice.

Medicine is the classic example of "so smart yet so stupid". Modern medicine represents the epitome of the practical application of the scientific method. It has been so successful in "saving lives" that it has been a major contributor to the global explosion of the human population. The "stupid" part arises from the short-sightedness of the application of medicine. In a nutshell we should ask ourselves "what's the point of saving a life only to have that life lived in poverty and misery before prematurely dying of something equally awful?". I contend that this is the longer-term fate, if not of those immediately "saved" by medicine, then almost certainly of their descendents. It is inevitable in a world of limited resources and expanding numbers. And most of the lives "saved" through antimalarial medicines just happen to be those in the most poverty-stricken, environmentally degraded, overpopulated corners of the planet.

Modern medical practice is fabulous news for an individual - if I were suffering from a disease and someone offered me a pill to cure it of course I'd swallow it. My issue is not with medical science. My issue is that it stops short of asking what strategies and interventions are best for the planet in the long run. And it is mathematically obvious that keeping more and more people alive, letting each of them live longer and allowing them to breed without restriction is NOT good for the planet. My preference, then, would be to severely restrict the population first, then treat the diseases... that way medicine can be seen as enhancing the quality of life for everyone, rather than contributing to inevitable overcrowded catastrophe.

In a similar vein I am happy to see, interestingly, that Melinda Gates is championing the rights of women to control their own fertility. This is a much more praiseworthy long-sighted goal and, I

think, a much better use of medical resources. It is axiomatic that unborn children don't grow up to breed - and they don't have to suffer from malaria either!

THE PARANORMAL

The label “paranormal” is generally attached to any phenomena that appears to defy the current scientific understanding of the way the Universe works. Included amongst these paranormal phenomena are the likes of ghosts, spirits, angels, fairies, UFOs, telekinesis, spoon-bending, extra-sensory-perception, the power of prayer, clairvoyance, kinesiology, tarot card reading, astrology, psychic readings, laying on of hands, water divining, out of body experiences, crystal therapy, homeopathy, faith healing, seeing auras and channeling the dead. The list is much longer than this - in fact it is probably only limited by the imaginations of those who invent such phenomena.

Obviously my emphasis on reason and critical analysis of belief leads me to be deeply skeptical of most experiences that fall under the canopy of “paranormal”. I put my case simply... if these claims are subjected to rigorous scientific investigation and it shows them to be valid, then they cease to be paranormal and can then be considered “normal” - explicable by natural physical laws. Over the years many claims of the paranormal have been subjected to varying degrees of scientific investigation. Rarely have they been shown to produce effects that are beyond those expected by chance. Or they are explicable in other more “normal” ways, such as confusing perception with seeing, not appreciating how our brains actually interpret things, or misapplying the logic of probability leading to a perception of meaning in coincidence. Or they can even just be the result of outright deception - intentional or otherwise.

Many other rational thinkers share my skeptical view - in fact I belong to the Australian Skeptics, a branch of a larger organisation founded some time ago in America specifically to subject paranormal claims to scientific scrutiny. Various Skeptics members have, over the years, offered large sums of money to anyone who can replicate any paranormal experience under strictly controlled conditions which de-emphasise subjective bias and are agreed to by both parties. So far no-one has been able to claim the prize. And yet numerous surveys repeatedly tell us that a huge percentage of the population say they still believe in one or more of the paranormal phenomena listed above.

There is an obvious disconnect between what the scientific method defines as “evidence” and what the non-science trained public accepts. I suspect that it is a failure of our education system to properly expose students to the skills of analysis, of critical thinking, and to the principles of logical argument and the methods of science. Even the simple application of probability theory to practical situations doesn’t appear to be taught well. Nor do we learn of the limitations of our senses and the mistrust we should have of our perceptions and memories. Only with an appreciation of these will we be ready to accept the objectivity of the scientific method as the most reliable path to understanding the real nature of things, where the inevitable distortions of our subjectivity have been reduced as much as humanly possible.

A specific subset of the Paranormal - the Psychics - serves to illustrate how easily uncritical and non-science-trained people are drawn in by the forlorn, though understandable desire to communicate with their loved ones beyond their death. Most people who claim they speak with the dead are either sincere but deluded, or are deliberately fraudulent. Either way, all psychics are skilled in a technique called “cold reading” whereby they fish for information through cleverly designed questioning. If an audience member can’t think of someone who “has a white cat, played the violin or rides a motorbike”, the psychic will say that if they think harder about it they will discover that either they do, or someone close to them does. All they need to do is to ask others when they get home. The psychic then quickly moves on to another subject. The rest of the audience is impressed, thinking that the psychic knows more about the person than the person himself! And if they go home and still finds no answer, the show’s over long ago... the audience never gets to see all the times the psychic got it wrong!

Vagueness of response is another tool in the armoury of the psychic... if they really were so good at what they purport to be able to do, they would be winning Lotto every week, or at the very least, not having to advertise in the local papers. They also rely on the fact that most people share experiences in their lives much more than they like to admit... We all had families of one sort or another. We all have made mistakes and had successes. We all desire to be loved. We all want success. We have all experienced death close to us... and we all like the idea of having someone concentrate on US even for a few minutes, telling us all about ourselves. To extend PT Barnum’s observation...there are many more than one sucker born every minute!

Most people who go to psychics are already believers, thereby creating an atmosphere of acceptance. The more someone believes in the paranormal, the more likely they are to think that what they have seen and heard has some significant paranormal component. And their memory of that event will be dramatically influenced by these beliefs. Audiences thus primed will be more likely to see meaning in random events, creating connections when there is nothing but coincidence. They will remember only the predictions or statements that matched their preconceptions while conveniently forgetting the numerous ones that didn’t. And they will attribute a degree of specificity to these statements that in fact they lacked.

ALTERNATIVE MEDICINE

If there was real evidence that “alternative medicine” actually worked, then it would be called “medicine”. The fact that it retains its “alternative” moniker actually means that there is no real evidence of its efficacy. This view obviously depends on what I mean by “real evidence”, so I’ll elaborate a little on this...

Human perception is fallible - very fallible. We tend to see meaning where there is none. We tend to observe patterns in randomness. We see mere correlation as causal. Our brains literally fill in the missing pieces to provide a complete picture of the world - both metaphorically and actually. We all carry around in our heads models of the world around us, and often spend enormous amounts of effort struggling to fit the real world into these models. All this internal deception happens because at certain times in our evolution these behaviours provided us with a survival advantage... Is that just wind rippling the grass or is it a lion? Reacting as if it is a lion, even if it wasn’t would be a survival advantage. The consequence of ignoring it as just random wind, and it wasn’t, would be catastrophic. We are programmed to give the benefit to the doubt... we are pattern-recognition experts, even seeing patterns, cause-and-effect and meaning where there is none. “Better to be safe than sorry” was our ancestral motto as our brains slowly evolved, securing our survival on the African savannahs.

This evolutionary perspective can help explain our predilection for forming conclusions based on the flimsiest of evidence. Aunt Maude swears that Evening Primrose Oil cures the common cold. Sure enough, every time she gets a cold she takes her Evening Primrose elixir and lo and behold, the cold disappears! Nothing anyone can say will dissuade her from her conviction that it works. The world appears to be full of “Aunt Maudes”, believing in the most tenuous links between cause and effect when it comes to curing diseases. Entire species of animals have been made endangered or extinct because certain cultures believed that grinding their tusks or testicles would cure impotence or gout. Billions of dollars are exchanged each year to have people wave their hands or magnets or crystals over various parts of other people’s anatomy in the belief that this will cure whatever ails them. Alternative medicine is now very big business. And yet it is based on little more than the same feeble quality of “evidence” that convinced Aunt Maude of the efficacy of her oil.

The fact is that most people become ill many times in their lives. Most of those illnesses pass as the body’s immune system copes with the invaders. Swallowing a pill or sticking a needle into the back of your hand while ill, in the belief that this will cure you, may not have any effect on you getting better, but if you are primed to believe that it will then when you do get better (and you mostly will) then you will more than likely attribute this to the pill or needle. Our brains are primed to see cause and effect even where there is none.

So how are we to determine what medicine REALLY works and what may be little more than hocus pocus? We use a scientific approach to the gathering and interpretation of evidence. We don't just take Aunt Maude's word for it. Herein lies the difference in the meaning of the phrase "real evidence". It is this scientific approach that distinguishes real medicine from its "alternative".

So, to outline this scientific approach I'll use Aunt Maude's contention that taking Evening Primrose Oil cures the common cold. How would we gather "real" evidence that tests this belief? We start by reformulating the belief as a "null hypothesis", thereby creating a statement that is genuinely testable. In our example we would state something like... "Swallowing a particular quantity of Evening Primrose Oil each day following the onset of a cold will not have any effect on the duration of that cold". Note how the more specific the statement is, the more testable it becomes. Note also that by stating it as a negative (ie, the Oil will have no effect) we can devise tests that could readily disprove the hypothesis, thereby providing strong evidence for the opposite (the Oil does have some effect) being true.

Once the specific, testable Null Hypothesis is stated, then our task as scientists is to devise experiments that will test it. Of course, it is not enough to test it just on Aunt Maude. If we're going to be able to generalise our results we will need to test a large number of people. Ideally we would test it on everyone, but this is obviously impossible, so we choose a group that is representative of the whole population. Rather than have our subjective biases guide the choice of people to be in this group we select the members at random.

We could just give the Oil to each of these people when they next get a cold and see what happens, but how do we know that any effect we see is due to the Oil and not to something else? We divide the group into two... half of them are given the Oil, the other half is given something that is indistinguishable from Evening Primrose Oil, but isn't. This second group, also selected at random, is the Control Group. By being selected and treated identically to the first group in every way except for the administration of the Oil we can be more certain that any effect seen in the first group but not in the Control Group is most likely due to the Oil and nothing else.

It is important that we select and treat the Control Group identically because of the well known phenomenon of the Placebo Effect. This powerful effect, whereby a patient gets better merely by thinking he is being treated, has been shown to be the force behind many treatments, sham or otherwise. To control even more effectively for this effect we introduce yet another protocol into our methodology... the Double Blind test. In our example, not only are the patients unaware of whether they are being administered the real Oil, but the doctors, nurses and even those conducting the experiment are also unaware of who was getting the real Oil and who was getting the fake oil. Only when the experimental results are collated will it be known which patient

received which treatment. In this way, with both patients and experimenters “blind” to the actual treatment can we be sure that any effects observed are due only to the Oil and not to any subtle placebo effect on the patient, or bias from the experimenters.

Thorough though this process is, the scientific method doesn’t end there, though. Always questioning, scientists will then publish their results where they are reviewed by their peers and encouraging similar experiments to be performed by independent scientists elsewhere, increasing the sample size and decreasing any chance for bias or error.

Let’s assume that such “peer-reviewed, large sample, randomised, double-blind controlled tests” were carried out on the effectiveness of Evening Primrose Oil and every one of them showed that those treated with the Oil generally recovered no sooner than those in the Control Group, what have we “proved”? Well, scientists are a cautious lot... they will state their conclusions by relating back to the original null hypothesis. They might say, for example, that within an acceptable range of probabilities, their null hypothesis is supported by the evidence. In other words, there is a statistical probability that the Oil does not affect the duration of a cold. Rarely does science use words like “certain”... because we can’t test the entire population, there is always the possibility of someone finding Evening Primrose Oil genuinely efficacious, beyond mere placebo. Science speaks of probabilities... of statistical evidence supporting (or not supporting) a hypothesis. And it is this very caution in the language of Science that often leads to mistrust by the unscientific population, who appear to be attracted more to the simplicity of certainty.

Furthermore, experimental conclusions are constantly being reviewed in the light of our understanding of the “rules” that underpin our understanding of the way the physical universe works. If a physically explicable chain of cause and effect can be established to explain the observations, then more confidence can be given to the conclusion. So when medical science speaks of “evidence” they mean data gathered in this rigorous way and explained by accepted, tested physical laws. Many now refer to “mainstream” medicine as “evidence based” medicine, to distinguish it from “alternative” medicine where the requirements for proof of their effectiveness are vastly less stringent. As suggested above, so much of the apparent efficacy of alternative medicine is due to the placebo effect - an effect which can be demonstrably greater in those who believe in the power of the particular treatment, or the skill of the practitioner.

Obviously submitting every claim of alternative medicine to “replicated, large-sample, randomised double blind controlled” experiments would be a daunting, and expensive, task. But for some it has been done. Naturopathy, homeopathy and acupuncture are among those which have been tested using this scientific methodology. Once we filter out those tests which fail to meet the criteria for lack of bias, inappropriate design, etc, the conclusions are inescapable...

statistically, these treatments perform no better than placebo. (I should note that the conclusions for acupuncture are not entirely clear, mainly because of the difficulty of establishing an appropriate double-blind control treatment. It is much easier with “pills”!). And yet people continue to spend millions on such treatments, obviously convinced of their effectiveness. Why?

I think it’s because most non-science trained people fail to distinguish between the objectivity of evidence gathered via the scientific method, and evidence they see for themselves. They appear to rely much more on the pronouncements of perceived authority and on anecdote than on controlled experiment. Again I put this down to a failure of our education system which appears unable to effectively instil the values of critical thinking and objectivity in our children, leaving them vulnerable in later life to being sucked in by peddlers of every alternative medicine from snake-oil to rhino horn; from dangling crystals over your chest to sticking needles into ill-defined “chakra” points; from visualising “energy fields” to bathing in radioactive waters.

My objection to the peddling of Alternative medicine goes beyond mere “academic” disagreement... there are real consequences of their relatively uncritical acceptance, not the least of which is their hollow promises distracting patients from seeking more effective evidence-based treatments, wasting their money, time and hope on unproven therapies. They can even have a financial impact on “unbelievers”, such as myself... I recently wrote an email to my Health Fund objecting to the fact that they now cover a variety of “complementary” medicine. This is what I said:

Please forward this email to whoever is in a position to influence Teachers Health Insurance policy...

I have been a member of Teachers Health for more than 35 years (member number 76XXXXX), over which time I have paid tens of thousands of dollars in premiums. But I have only recently been made aware that my health fund pays out for a number of "treatments" that have no scientific evidence showing that they work any better than placebos. These "treatments" are usually collated under the umbrella of "Alternative Therapies", and are to be found in your "Extras Cover" list. They include Chiropractic, Osteopathy, Acupuncture and Natural Therapies (whatever that is!). At least you haven't got Homeopathy on your list!

I most strongly object to my premiums being used to pay for these "treatments" when even a passing acquaintance with the scientific/medical literature shows that the vast majority of them perform no better than placebos when subjected to properly designed randomised, double-blind trials that form the standard for medical testing today. In fact, with the exception of a few "herbal" substances, such as Echinacea, they can all be viewed merely as nothing more than very

expensive placebos... at best being a waste of money, at worst encouraging people NOT to seek medical treatments which are actually proven to work.

Rather than reproduce here the compelling evidence for the above statements, I would direct you to just one book where the case against these therapies is very clearly made... "Trick or Treatment" by Simon Singh and Edzard Ernst. It leaves the intelligent reader in no doubt about the inadequacy, and even danger, of such treatments. If, after being made aware of the lack of real evidence for the usefulness of these therapies, you still wish to include them on your "Extras" list, then I would really appreciate an explanation as to why part of my expensive premiums are being diverted to fund this demonstrable nonsense.

Most people are unaware of the weight of evidence against the efficacy of these alternative therapies, sucked in by the clever marketing and downright mistruths perpetrated by those who make bucket loads of money from what amounts to little more than bogus snake-oil cures. However, I feel strongly that those of us with confidence in evidence-based medicine should not have to fund those who are either ignorant of the evidence, or unwilling to understand or accept it. In other words, if someone wishes to waste their money on "alternative medicine" then so be it. I just don't want them wasting MY money... medicine is expensive enough without my premiums supplementing the ignorance of others. If you really want to insure people who choose to access these therapies, then I suggest you remove those therapies them from the "Extras" list that we all contribute to, and place them in their own category for which people pay extra... and which I, as a scientifically literate member, can choose not to join or fund.

I would appreciate a response to this email with an explanation as to why you have chosen to include these therapies, and with a suggestion on how you might consider someone opting out of them (with a reduced premium, of course) or opting into them (by paying extra).

Thanking you,

Kevin Murray

P.S. Remember that "alternative medicine" with evidence that it actually works is called... "medicine".

Naturally their reply was defensive - basically suggesting that they are giving their customers what they appear to be demanding. They offered not one iota of evidence to support these "alternative therapies" being considered effective in promoting the actual health of their members... a point of irony for a "Health" Fund, don't you think?

DEMOCRACY

Democracy is flawed, but it may possibly still be the best system of government humans have yet devised. I would, however, like to propose a modification to the democratic process that I think would make it less flawed. I call it “Informed Democracy”.

Regardless of the operational convolutions embodied in the historic origins of the World’s diverse democracies, the basic premise behind all of them seems to be “one person, one vote”. I contend that it is this premise that is Democracy’s Achilles Heel. It is blindingly obvious that not all votes are equal. Not all voters are equally informed of the issues on which they are voting. Standing in line at our local polling booth every few years reinforces this inequality as I hear the conversations around me... “What Ward are we in?”. “Who is our local member, again?”. “Is this a State or Council election?”. “Why do I write numbers on one paper and Xs on the other?”. “If I vote Green does my vote always go to Labor?”.

Perhaps the better-informed voters in my queue aren’t quite as voluble, or perhaps those who are even less informed than those I overhear are keeping their ignorance more to themselves, but whatever the reason, it is hard not to conclude that large numbers of voters have little clue about the issues they’re voting on... and yet each of their ill-informed vote carries exactly the same weight as that of someone who has diligently studied the issues and candidates and who fully understands the particular system under which they are casting their vote. To me this “one person, one vote” principle is clearly wrong.

Under my system of “Informed Democracy” each person’s vote is given a weighting. The weight of your vote is determined by the level to which you understand both the voting system, the views of the candidates and the issues on which you are voting. Someone who has a deep understanding of these things will have their vote weighted to be worth more than someone who understands little. In this way the original intention behind Democracy - where governments are elected by popular vote by an informed populous - is restored. And, of course, people discover that it is in their interests to become better informed for their vote to count. All very well in theory, though. But how might this system work in practice?

Glad you asked... Firstly, I imagine that we do away with all the archaic trappings of voting booths, paper and pencils, having your name crossed off manually when you vote, etc. The whole process can be done over the internet, with state-of-the-art security and identity systems in place. This should not be difficult, after all most of us trust our banking details to be processed online and, at least in Australia, the national betting agencies manage millions of “votes” online every day where the security of large amounts of money is confidently ensured. So, it would not be difficult to establish an online voting system that identified who you were, and ensured one person, one vote. Then what?

Then all that needs to occur is some way of establishing the “worth” of your vote. I suggest we also do this online. Come voting time you log on, have your identity verified then you are required to do an online quiz. You are asked to provide answers to ten questions. Most (if not all) of these would be multiple choice. Your particular ten questions would be selected from a large database of questions, all of equal “value”. The choice of “your” questions depends to some extent on where you live, but is otherwise random. This randomisation would help guard against cheating. The questions would all relate to the voting process, the candidates or the issues. Examples of these questions would be...

Who is the current sitting State member of Parliament for your district?

Name three political parties vying for seats in your electorate.

A major difference between the House of Representatives and the Senate is:

Which of the following candidates has spoken out against immigration?

Which of the following suburbs is not in your electorate for this election?

Which political party is currently representing your electorate at the State level?

From the following list of issues, tick those that were prominent for all candidates in your area...

Etc...

Once you have answered ten questions you cast your vote. Now comes the crucial bit... your vote is automatically given a weighting based on the number of answers you got right. In other words, if you got ten right, your vote is worth ten. If you got three right, your vote is worth three. If you didn't get any right, your vote, while still being compulsory, will not be worth anything. You would also instantly be told online what your vote was worth - without revealing any answers to the questions, of course.

Naturally there are numerous details to work out... language difficulties, internet access, computer proficiency, security questions, etc, but I feel that none of these are insurmountable... In fact the TAB and the banks overcome these every day with little bother! There are others, such as the validity and reliability of the questions in the databank that will require extensive trialling. I foresee a transition period where polling booths are phased out - probably becoming internet stations where you can get real-person guidance if needed during the changeover period.

When I told a friend of my “Informed Democracy” idea she objected that it would encourage cheating on the quiz... that people would soon learn about the types of questions asked and “swat up” on them beforehand. My response was that this shouldn’t be seen as “cheating”, rather as a motivation to become better informed before casting their vote. A student who knows the types of questions to expect in next week’s maths exam and spends time preparing for the quiz is not accused of cheating... they are studying.

Along with the obvious advantages of the differential value of each person’s vote will come the considerable advantages of using the internet for voting... it will be much cheaper, more convenient, more accurate, less open to fraud, much quicker in getting a result and the internet will be a useful platform where people can learn about the system, the candidates and the issues... well before they cast their vote. Or at least they WILL want to learn about these things if they want their vote to count!

TRIBALISM

I had a hard time deciding what to call this chapter. I wanted to present my thoughts on racism, on nationalism, on patriotism, on discrimination, on prejudice, on sectarianism, on multiculturalism, on bullying, on sport... and even on war. I have recently come to realise, however, that these are all different aspects of the same thing... a behavioural tendency with a common evolutionary origin. I call this trait Tribalism.

For thousands of years there was a clear survival advantage for our species to protect the family group at all costs. It was the family group that was the basic unit of our evolutionary past. An individual human would be of little use without the support of the family. Newborns would have little chance without family support, especially during the vulnerable years of a long childhood. While anthropology has until recently over-emphasised the importance of the male task of hunting, we have recently discovered the role of women not just in collecting and preparing the majority of the family's food, but in rearing the next generations to adulthood.

Protecting this vital evolutionary unit was ingrained into our behaviour very early on, emphasised moreso in our species than in any other... mainly because the combination of upright stance and large brain required an almost "premature" birth, with the all-but-defenceless baby relying entirely on the family for its survival. As families grew in size these protective instincts extended to small groups of related individuals, then to larger tribes, districts, regions and even countries. In order to protect "our own" people, evolution shaped our behaviour to recognise characteristics that more likely reflected a close genetic similarity - after all, the driving force lying behind such evolution is Natural Selection, whereby the whole "point" is to maximise your own genes in subsequent generations. Protecting those that are more likely to carry genes similar to yours is one very effective way to do this.

So how were we programmed to recognise "our own" people? Quite simply our brains were shaped by Natural Selection to recognise characteristics such as facial features, skin coloration, body shape, etc that more closely resembled ourselves. It was not too much of a jump to add behaviour to this list of characteristics... people who looked and behaved similarly to me were more likely to be related genetically, so were "more worthy" of my protection. Of course, the flip-side to this was that anyone who looked or behaved differently to me were to be feared or shunned.

In this way Tribalism - looking after one's own at the expense of others - is seen as an inevitable consequence of Natural Selection acting on the "related group" level. Because evolution has no ultimate purpose or direction, we find ourselves burdened with characteristics which were once useful but which, in a different world from the one in which they evolved, can remain to be at

best irrelevant or, I contend in the case of Tribalism, to make our lives much more miserable and complicated that they ought to be.

Perhaps a few examples can illustrate this point better. Let's take racism. I contend that the origins of racism lie in the instinctive recognition of physical characteristics that once usefully identified "us" and "them". This enabled us to place our energies into maximising the chances of "our" genes surviving while diminishing the chances of competing genes ("theirs"). Contrary to popularised views of ancestral behaviour, this didn't always result in tribal warfare... more often than not it resulted in ritualised shows of strength ("sabre-rattling") and intertribal marriages... a kind of "if you can't beat 'em, join 'em" solution to maximising your genetic continuance. The instinctive ease with which we recognise "other than us", however, makes it all too easy to generalise about "them", especially where blame needs to be placed when times get tough. And leaders of "tribes" throughout history have known how to exploit this remnant instinct for their own purposes, often leading whole nations into war against an enemy, often so dehumanised as "not us" that mass extermination is not even defined as "murder".

As a Biologist I recognise that the percentage of genes that are different between any two individual humans considerably exceeds the percentage of genes that differ between so-called "races", meaning that biologically speaking there is really no such thing as "races" of humans. All humans share a common ancestor... and all "races" derived from a small band of people who wandered out of Africa only some 70,000 years ago. All humans are pretty much closely related. Knowing this should (in my rational world) override the remnant "us and them" drive from our distant past, allowing us to see past superficial differences of both physical appearance and culture and recognise the vast similarity that lies very close to that surface. If we could all define ourselves as "humans" rather than Caucasian, or Inuit, or Asian, or Black, or White we could instantly overcome the illogical distinction of "race".

Closely related to this issue of race is that of nationalism. A nation is really just a big tribe. It is far too big for individuals to be able to personally recognise other members of this tribe, so we design characteristics that define us all as "us" to make recognition easier. We share a flag, an anthem, "national dress", a language, a culture. We write books, sing songs and write poetry celebrating our mutual superiority over "others". We adorn our sports people with nationalist trappings and cry when they stand on the podium, hand on heart as the National Anthem plays. And when we go to war, and skin colour or body shape isn't enough to define the enemy, we invent characteristics - usually disgusting cultural behaviours - that help define them as not only less than "us" but even less than human, allowing us to more compliantly wipe their genes off the face of the earth.

Patriotism is the extreme form of nationalism that I see as the antithesis of intelligent understanding. I shudder at the sight of streets full of angry flag-waving, fist raising young men (they are usually young men). There appears to be no room for quiet discourse or intelligent problem solving in that environment. All I see is the ancient imperatives of “us” and “them” rising to the fore... and the result usually being bloodshed and misery.

Sectarianism provides another example but here it combines the base instincts of tribalism with the irrationality of religious devotion into a toxic mix of anger and hate which even the most benign of rational thinkers would find insoluble. In times and countries where the power of a church is used to govern the running of the country, it is so easy to motivate people to lay down their lives for almost any cause... a promise of heavenly reward or fear of eternal hellfire is enough to drive any young man to battle. If it wasn't so tragic it would be funny to watch as each side before entering the battlefield prays for victory - often to the same god! I cry for the millions of lives lost for causes little more substantial than a difference of opinion over how many angels can fit on the head of a pin. Madness.

Sport. Yes sport is yet another example of Tribalism. To me it makes much more sense than all the other “isms” so far discussed. It clearly exemplifies the “us and them” origins of Tribalism, but epitomises the ritualistic show of strength that doesn't run the risk of mutual annihilation that accompanies warfare, but still displays your (personal, family, tribal, national) strength. In my rational world wars would be decided on the footy field. The US - Iraq war was basically one side saying to the other “Our system is better than your system, so let's bomb the hell out of each other to prove it!”. Let them play footy to prove which system is better... it makes just as much sense as a war and the consequences are nowhere near as tragic.

Great leaders throughout history have known that the best way to unify a divided country is to have a common enemy, so we become “us” and the enemy becomes “them”. Many of these leaders have also known that if no common enemy exists it is not too difficult to invent one... just label them Jews or Tutsis or Aborigines, provide propaganda that identifies their sub-human characteristics and watch how a disunited people rapidly recognise their own sameness as they work together to eliminate the enemy.

My wish is for this to happen at a global level. The world now is really as small as a country... it takes just as long for me to travel to the other side of the world as it did for my grandfather to cross the Blue Mountains. I can see and talk with someone in New Delhi on my iPad as if she were sitting at my breakfast table. Surely the time has come to eliminate the divisiveness that merely reflects a once useful ancestral trait and emphasise our sameness as humans, all from planet Earth. Of course it would probably be too difficult for a global leader to invent a global enemy (ever since “War of the Worlds” we have generally become less gullible about

extraterrestrial invasion). However there are numerous global enemies within... anthropogenic climate change, overpopulation, pollution, species decline, etc... which, while not as obvious or immediate as an alien attack could still be regarded by a creative leader as global enemies. Uniting against these enemies would be a vastly more useful avenue down which to channel our ancient tribalistic tendencies.

THE ENVIRONMENT

When I was a kid I would watch “Nature” programs with unabated enthusiasm. My jaw would drop and my heart skip a beat as the astounding beauty and complexity of our wondrous natural world unfolded before my eyes - albeit in black and white. Nowadays I can hardly bring myself to watch “Nature” programs. My heart now sinks as program after program either ends with (or even starts with) some dire warning of the damage we humans have done to a particular species or ecosystem... or even to the entire biosphere. I can easily imagine future generations of people, living on a denuded Earth where the only “Nature” they see is in scratchy old David Attenborough documentaries, looking back at our current generation and saying “What on earth were they thinking?”.

I don't think we're thinking at all... at least not about the things that should really matter. We appear to be obsessed with money and the stuff money can buy. We behave as if money is something “real”, rather than being an artificial invention that long ago lost its role reflecting the real value of something and which now has become an end in itself. And we measure the “worth” of things in this artificial currency... An elephant is killed for the monetary value of its tusks. We appear to have lost the sense of the value of an elephant as an elephant. Or a forest as a forest, merely identifying it as a “resource” worth X amount of dollars. How stupid are we?

In fact, we are SO stupid that we let economists - the “priests” of this money worshipping cult - guide our politics, fooling our leaders into believing that the only worthiness of anything is that which can be expressed in dollars. These same economists even explicitly classify “the environment” as an “externality”... something that need not be included in their calculations when deciding on policy. How did we come to be so disconnected with the rest of the living world that we even talk of “the environment” as something outside of us and not as it truly is - which is everything, including us? We even talk of “the animals” and humans, as if humans aren't even included in the same classification as animals. How did this crazy situation arise?

I contend that this disconnect has its origins not only in economics, but in religion, tribalism and technology as well. Let me explain...

Religion is an invention of humans to satisfy their need to make sense of a complex and confusing world. Religion simplifies this world by passing responsibility for its capriciousness on to make-believe gods, thereby absolving humans of having to face the seemingly endless cycle of answers begetting more questions... it is enough for many people to be told that gods work in mysterious ways, or that God has his reasons, or don't ask why, just have faith and accept. Since religion is really just organised wishful thinking it usually actively discourages actual exploration of how the world really works. And since it is an invention of humans, religions tend towards over-emphasising the place of humans in the natural world, even to the

extent of denying that we are even part of the natural world. Since the holy books of the world's major monotheistic religions were written hundreds of years before we understood our genetic and evolutionary connection with all other living things, their writings are inevitably at odds with these later findings. Anyone with a reasonably strict adherence to these holy books would have to close their eyes to what science has since revealed. Which explains why in a recent survey over 50% of Americans believed that humans were created separately from the other animals at some relatively date, despite the enormous weight of scientific evidence to the contrary.

So, most religions inevitably tell us that we, as human beings, are somehow very special. We were created as special, and we alone have the ear of the gods. Many religions endow us with a soul, something that no other animal has. By offering the belief that we can even influence the world through prayer and sacrifice, and that "we" will in some form live on beyond our death (or even re-appear back on earth in some other form) religions suggest that we need not even be bound the regular laws of nature. No wonder, then, that anyone who chooses to believe in some higher power that treats humans as special finds themselves increasingly disconnected from the natural world and the physical laws that govern it.

Before moving on, I should hasten to add that there have been (and still are) many religions which DO emphasise the place of humans in the natural world... and encourage their members to care for their environment in a more holistic way. Such "animistic" religions are, however, small in both number and influence these days, and still retain the characteristics of being anthropocentric, still imagining the gods as treating humans as special.

Another influence behind the disconnect of humans from their environment is tribalism. Throughout our evolutionary history Natural Selection has selected those behaviours that allow us to more easily identify those that are of "our" group, who we treat with care, and the rest of the world as "other" to be exploited, mistreated, even eliminated. This served us well when our numbers were low and our impact on the world small, but as our numbers soar past 7 billion and our technology allows one man operating a joystick to fell an entire forest in a week, we should pause to reconsider the genetic predisposition we have to view the world as "us" and "them".

I often wonder how humans can be so cruel... not only to each other but to other animals. I suspect that Tribalism may lie at the root of cruelty. Few other animals seem to get their kicks from the suffering of others. Sure, the natural world is full of agonising deaths and painful injury, but most is either in the pursuit of food or part of a learning process for predators. The "us and them" dichotomy is particularly strong in humans, causing me to chuckle whenever the debate about whatever happened to the Neanderthals when Homo sapiens met them. The extensive history of encounters between human invader and invaded gives us a pretty strong clue... Neanderthals would have been so different in so many ways to "us" that the label of "other"

would have been easily and instantly applied and the extermination begun. To the invading humans the situation would have been treated no differently to the inevitable dehumanising of the indigenous inhabitants of America or Australia or Canada...

Similarly it is no surprise that Homo sapiens is the only species of hominid left, out of dozens of species that we know of. We are almost the only species of ape left, too... and are doing our best to wipe out the remaining orang-utans, gorillas and chimpanzees. The tribal protective instinct in humans is so strong that it doesn't appear to stop at racism or nationalism. It leads to speciesism, ensuring that no other hominid species and only a handful of species of ape is safe around us. Those religions may have been right after all... we ARE special. We are special because we stand alone as being so overprotective of our own "kind", and so technologically superior when it comes to weaponry that we have all but eliminated anyone that looks remotely different. We are a cruel species.

The remaining influence on our environmental disconnect is technology. Sophisticated tool making is a defining characteristic of humans. As our tools allowed us to farm the land and build cities the numbers of people who became separated from food production grew. Our farming technology is now so "sophisticated" that for the first time in human history many more people live an urban lifestyle than live on the land. Many city children these days have difficulty identifying where milk comes from, or eggs, or beef. We travel the world embraced in little cocoons of air conditioned comfort. We are no longer aware of the influence of season or geography on the availability or type of food. Most of us hardly see any stars any more. So much of our immediate environment is man-made and so little remains uninfluenced by humans that we have come to accept it as normal. In such a world it becomes easy to think of a forest as timber, or an ocean as a fishery, or a mountain as a coal reserve. Our technologies make it increasingly easy to exploit these "resources", giving us the false impression that they have been put there just for us.

When we combine the influences of religion, tribalism and technology with the false value systems of modern economics we get a toxic mix of attitude, behaviour and power that enables our species to single-handedly trigger one of the most devastating mass extinctions since a meteor strike 65 million years ago wiped out 85% of life on this planet. This is not a record worth celebrating!

In my ideal world where ethics and behaviour are governed by reason and not by faith, superstition and an unquestioning acceptance of our genetic imperatives, there would be far fewer humans, all leading comfortable lives using technologies that enhance their lives without inflicting long term damage to the planet. Our energy sources would be sustainable or renewable. Our food would be farmed humanely on land that we would share with other more complex

ecosystems. In fact, I think it would be reasonable if we actually declared half of the planet off-limits to humans. To me that seems pretty fair... one species dominating half a planet, leaving the other half to the millions of other species.

Of course, this world can never happen... we long ago passed the point of no return. Our 7 billion people are already living on resources borrowed from far into the future, already living as if we inhabited four other planets as well as this one. We should have been smart enough hundreds of years ago to view ourselves as PART of the environment, not separate from it. Once we realised this we could have foreseen the environmental catastrophe that lay ahead, limited our population, declared huge ecosystems out-of-bounds, not released technologies until their REAL, long-term environmental impact could be assessed and run our “financial systems” using currencies which represented the REAL value of things, not allowing the currency to become valuable in itself. And, oh yes, started making political and lifestyle decisions based on rational principles and scientific investigation instead of blind religious superstition, allowing us to truly appreciate the place of humans in this complex, wonderful, beautiful and amazing world.

We missed that opportunity last time. Maybe there will be a second chance. Maybe when we eventually see the reality of how we cannot stand apart from the environment, and when Nature inevitably restores some semblance of balance, probably decreasing the human population dramatically, maybe then we will see where we went wrong and get it right next time. We can but live in hope.

FATE, FREE WILL...

Fate is a very strange concept. It is bandied about in everyday conversation as if we all clearly agree on its meaning, but when we are pushed it becomes much more difficult to define. This slipperiness of meaning doesn't stop it being a cornerstone for many cultures and belief systems. Phrases like 'It's God's will', or "It is in the lap of the gods", or "It was destined to be", or "It's written in the stars" all reflect the same concept. What they all seem to imply is that no matter what we "mere mortals" choose to do, whatever happens has been somehow preordained, or at least pre-determined. This implication is then taken to justify or explain events and behaviours, suggesting that whatever happens is somehow not my "fault" but happens regardless of anything I might do to change it.

I suggest that this is a nonsense concept... or at least, meaningless. At some theoretical level I could agree that if the physical attributes of every single particle in the Universe were known precisely soon after the Big Bang, then you could, in theory, predict every future state of those particles merely by applying the laws of physics. This would not only apply to predicting the agglomeration of these particles into stars, galaxies and solar systems, but since you and I are also sacks of chemicals - albeit arranged in very complex ways - it would enable the prediction of our own existence. It also, theoretically, would enable the prediction of all our behaviour since behaviour is a result of brain activity and brain activity is chemical and electrical activity also subject to the same physical laws that shaped the rest of the Universe.

This line of argument inevitably leads to the conclusion of predetermination... and may well be used to support the concept of "Fate". But it doesn't. Why not? Let's look at the assumptions behind the above argument. It assumes precise knowledge of the position and the momentum of every particle in the Universe soon after the Big Bang, 13.7 billion years ago. This knowledge is not just practically impossible, it is theoretically impossible too. The early universe was so dense and so chaotic that it was dominated not by the laws of "classical physics" but by the quirky uncertainties of quantum mechanics where particles unpredictably pop in and out of existence and where matter and energy are indistinguishable and interchangeable, making the concept of a "particle" very slippery indeed. One of the cornerstones of quantum physics is the impossibility of knowing the position AND the momentum of any particle at the same time. Besides, even if we were able to "know" the original states of everything immediately after the Big Bang... who exactly is this "we" who is doing the knowing? By definition it would have to be someone outside the universe they were observing... and since clearly "we" are in this universe the knowing could not be done by us! Besides, even if it were possible, to store all this information about all these particles would require a storage space many times larger than the actual universe itself... which begs the question "where is the information about that "storage" universe stored... an infinite regression which, if not impossible is definitely inaccessible to our humble brains.

So, the “physical laws” argument for predetermination appears to fail. But does it? Look closely at the argument. It suggests that knowing the characteristics of every particle in the universe at its birth would enable us to PREDICT all future interactions of these particles, regardless of whether they were inside a star or inside your head. The realisation that it would be impossible to PREDICT future interactions doesn’t mean that these future interactions weren’t really predetermined purely by the initial state and the laws of physics... it just means that no-one, ourselves included - can ever know with absolute precision what these future states will be. So, while all our futures may well be “fated”, pre-determined by the initial conditions of the Universe and the adherence by its constituent particles to the laws of physics, the nature of that fate will be forever unknowable to us. The evolution of our Universe may well be predetermined but predicting what will happen next - especially when it involves the kind of complex chemistry that goes on in a human brain - is impossible. Hence the meaninglessness of the concept of Fate...

Take, for example the following scenario. I am waiting at the kerb for the crossing light to turn green, absorbed in my iPhone screen. The light goes green and I begin to absent-mindedly step onto the roadway. I hesitate and decide that I’d better look up beforehand. At that very moment a car whizzes past, mere centimetres in front of me. Had I not decided to look up I would have been killed. The woman standing on the kerb beside me grabs me by the arm and breathlessly tells me that it I just “cheated Fate” by changing my mind at the last second. But I could equally argue that it was “Fate” that led me to choose to look up when I did. We are both equally right and both equally wrong. The complex arrangement of particles that evolved since the Big Bang to be “me” came together on this day into just such an arrangement - especially in my brain - to force me to look before stepping off the kerb. In that sense my decision to hesitate was predetermined... except I would only know that AFTER my near miss with the car.

Because the future is impossibly unpredictable we can attach the label “Fate” to events only AFTER they have happened, even though their very happening was predetermined 13.7 billion years ago. It is because the concept of Fate has no predictive value that I describe it as a meaningless concept. Whether you “believe in Fate” or not is irrelevant to what happens to you. And attaching the guiding hand of an imaginary deity to Fate is even more meaningless. Assuring that it was “the will of God” that my house was smashed to smithereens by the tornado while my neighbour’s house remained mockingly intact has no meaning. The path the tornado was to take was long ago determined by the initial conditions of its constituents and the physical laws that acted on them. Nobody could have predicted with any certainty the actual route the tornado would take. But physics alone determined that it was my house that would be destroyed. All attribution to “God’s will” or Fate can only happen after the event. It is merely an illusion with it’s origins in our human predisposition to ascribe meaning to events, no matter how meaningless they really are. We search for explanations and a lazy path to an answer is to

externalise responsibility for things that happen to an outside force beyond our ken. Hence, to god.

So Fate is little more than an illusion. A label attributed to events that has meaning only after the event has occurred. Similarly, the concept of Free Will is illusory. What we call our “free will” is really nothing more fancy than our perceived ability to make decisions of our own. We make decisions with our brains. Our brains are extremely complicated organs that ultimately work by the complex interactions of the myriad of chemicals of which they are made. As outlined in the above argument about Fate, the interactions of these chemical in your brain, while ultimately determined by their adherence to the laws of physics acting on them (and their countless antecedents), remain unpredictable. No matter how complicated was the path we took to arrive at a decision, no matter how many times we changed our mind, or for what reason, no matter whether we changed our mind at the last second or acted on a plan conceived much earlier, whatever the decision that is eventually taken it can only be defined as “our own” final decision AFTER it has been made. The sense of the decision being made “freely” by me is as illusory as the sense that Fate preordained the outcome of a tornado’s path. But the “sense” of having free will is real... because that sense itself is the product of the physical interactions occurring in your brain. So while the concept of Free Will is illusory the sense we have of behaving as if we have Free Will is as real as any other thought process occurring in our brain. Whether one “believes” in Free Will or not is, like belief in Fate, irrelevant, since the label can only be applied after the “freely made” decision has been made. And as with Fate, the concept of Free Will offers no predictive value, being only capable of looking back on a decision and saying “I made that choice with my own free will”.

So where does this leave the notion of responsibility for one’s decisions? Once we eliminate the idea that some external agent (like a god or Fate) can determine how we should act or the decisions we make, then all that is left to take responsibility is YOU. You are responsible for your actions and thoughts and decisions. You are the result of billions of years of cosmic evolution, leading to this very point where the myriad components of which you are made interact in a way that result in this or that decision. The direction your decision takes is influenced by everything that makes you, you... your genetic inheritance, your upbringing, your interactions with others, your evolutionary history, the food you ate, your education, the books you read, that nearby supernova that exploded billions of years ago... everything. Regardless of the pressures you feel driving your decisions one way or another, you are you. And just as the tornado was responsible for the houses it destroyed or saved, so too you are responsible for every one of your thoughts and actions.

No longer should you be able to justify your actions by saying it was preordained or “it is God’s will’ or “it’s because of the way I was raised” because these can only be used to label an action

after it has happened, not to justify it beforehand as if it were inevitable. A young man abused as a child can not use that fact to justify beating his wife, as if such behaviour were inevitable. Regardless of the predetermined future of his particular clump of chemicals he can never be certain what that future is. From his point of view it may well be that those chemicals form in a way that leads to a decision to be a loving husband, not a wife-beater. As far as he is concerned he has Free Will and as such should be held responsible for any decision he makes. The tornado, of course, lacks the complex chemistry of a brain so, while it is responsible for its destructive ways, it has no illusions of Free Will, so can't be held to account for its actions. A human being - in fact any animal with a brain large and complex enough to be self-aware - is both responsible and accountable for its own decisions.

Before leaving the realm of Fate, predetermination, Free Will and responsibility I'd like to add two more somewhat related concept into the mix. These are the concepts of luck and prayer.

Firstly, luck. Once again, here is a label - lucky - that can really only be applied after an event, yet is commonly applied before, usually as a descriptor for a person, as if the assignation itself contains some predictive value... "He's such a lucky person". "I'm on a lucky streak". Statements like these are thrown about in conversation without much thought given to what they really mean. Used after a streak of wins at the roulette table, for example, it can almost make sense. If we use the word "lucky" to summarise something that is both serendipitous and rare - and has already happened - then that's a reasonable use of the word. If we use it to describe the person who experienced the winning streak then that is not quite so reasonable. Why? Because it attributes a characteristic (lucky-ness) to the person that implies that they will continue to experience similar good fortune... in other words, it is making a prediction of future good fortune based on their past good fortune. Probability doesn't work like that. Just like the rest of the Universe, the roll of a dice or the spin of a roulette wheel is governed by the totally impersonal laws of physics. The fact that I have just scored five reds in a row at the roulette table doesn't make the chance of another red (or a black) any more or less likely. It certainly doesn't depend on whether or not you "feel lucky". Such a feeling is as illusory as the sense of having Free Will. The probability of an event happening will be what it will be regardless of the way you feel about it... until you label it as lucky or unlucky after the event.

The only rider to this last commentary about luck is the observation that certain types of personalities tend to expose themselves more to opportunities where good fortune is more likely, so, by chance, they tend to experience more "good luck" than other less adventurous types merely because of their increased chance of being exposed to fortuitous events. It is still, however, not accurate to ascribe to them the label "lucky". More correctly, they should be described as having personalities which make them more inclined to be alert to Life's opportunities.

Another aspect that needs discussion when considering the concept of Fate is that of “prayer”. The idea of prayer appears to be common to all religions. Basically prayer is where a believer asks their god (or gods, or angels, or ancestor spirits, or whatever) to intervene and alter the “natural” direction of events for some purpose. Most often this purpose is to benefit the one doing the praying (more wealth, luck, good fortune, fertility or better health, etc.) or for the benefit of others (victims of earthquakes, fires, cancer, etc.). The pervasiveness of prayer across all religions suggests that there must be “something in it”... that it must work at least some of the time or else why would people spend so much time and energy continuing to pray?

Once again an objective analysis of the evidence shows that prayer appears to make no difference to an outcome. Of the thousands of sick people who have visited Lourdes, praying fervently for a cure, not one has been cured in any way that defies a naturalistic explanation... All it would take is for a missing limb to miraculously regrow or a severed spinal cord to instantly rejoin for the power of prayer to be demonstrated. Instead, most the purported cures appear to be for illnesses that have a significant “psychological” component to them, or which were going to get better anyway, or which can be explained by nothing more than the placebo effect, or which recurred beyond the spotlight of Lourdes, after the adrenaline buzz of the visitation wore off. Whenever we have applied the criteria of “peer-reviewed, large sample, randomised, double-blind controlled test” statistical analysis to see if prayer makes any difference to the healing process, it consistently shows that prayer has no effect greater than placebo. Of course, this should not surprise those of us who realise that there is no such thing as gods, spirits, etc... meaning that prayer is, in fact, little more than a conversation with an imaginary friend.

But the illogicality of prayer goes beyond even this level of delusion. Let’s take our earlier scenario where the tornado swept its devastating path through that unfortunate town. Of course, living in a tornado-prone area might encourage the believer to pray fairly frequently that they be spared the destruction. For some - those whose houses were spared this time - these prayers would appear to have been answered. For the others, well, God must have had a reason not to have heeded their prayers... and since religions have this habit of instilling a sense of unworthiness within each of us, it is not much of a stretch for the “unlucky” ones to imagine God’s displeasure at them, encouraging them to pray even harder in future.

Of course, this behaviour merely reflects the principle of “intermittent reinforcement”, the same psychology that drives the poker machine addict to keep inserting more coins in the hope of the very occasional big win. But just as the spin of the poker machine wheels is determined by the laws of physics, uninfluenced by the player’s wishes, so too the outcome of the tornado is unaffected by prayer. As our discussion regarding Fate concluded that the “natural” direction of any event is predetermined but unpredictable, so too is any event where the believer asks god,

through prayer, to intervene. The presence or absence of the prayer is absolutely irrelevant to the outcome which is entirely determined by physics - and it will sometimes happen the way the believer prays for, and sometimes not... and there is absolutely no way of knowing BEFOREHAND which way it was going to go anyway. So, even if it turns out to be the way you prayed for, no matter how unlikely that outcome might appear, that can not be used as evidence that your god “influenced” the “natural” course of events. It is mere coincidence.

To my mind the epitome of the senselessness of prayer is the sight of two warring sides about to go into battle, each praying fervently for victory... and often praying to the very same god, believing that god is on their side. And, worse than this, even when their god appears to let them down and their side loses they justify it by “reasoning” that god must have had his reasons... even though they’re not immediately apparent to us mere mortals.

Richard Dawkins once interviewed a preacher whose church was just destroyed by a tornado. The preacher was praising God that no-one was severely injured. Richard then asked if God was so all-powerful then why did he not answer the earlier prayers imploring him to save the church. In fact, why doesn’t God prevent tornadoes altogether? The only possible answer the preacher could give was the old standby... “He must have His reasons, and I can’t know what they are...” Once you are committed to a world-view where everything happens for “a reason” it becomes quite problematic to discover what those reasons are! Of course, rationalists like me who recognise no ultimate purpose behind anything, but only see the world behave as it should if it were to merely follow certain natural laws, are never bothered by such questions. We need never even ask “why should that innocent 5 year-old child be gunned down?” or “why was my house destroyed while yours still stands?” or “why was I the only survivor of that shipwreck?”. For us these are “mu” questions... that is, questions that have no meaning in their asking, because the assumptions behind the questions (eg, there is a purpose behind all things) are demonstrably fallacious.

EVOLUTION

That every species on this planet, including human beings, has evolved from earlier forms of life is a fact, accepted by anyone willing and able to examine the huge volume of evidence. The only people who dispute this fact are those who choose not to look at the evidence. These people are usually blinded by a misguided belief that their imaginary god has somehow revealed a different version of the origins of life. I used to waste a lot of breath arguing the case for evolution with the assorted religious believers I have inevitably encountered, but now I realise there is no way to penetrate the closed circle of their “logic”... their god says it happened this way, so it must have happened this way because their god also says that their god is always right - hence any evidence or argument that appears to contradict their interpretation of their god’s version just has to be wrong. End of argument!

Suffice to say that when you recognise the fallacy of this ultimate “Argument from Authority” and quite properly ignore it and the subjective bias it reflects, then the evidence for life on Earth having evolved is so strong that arguing against it is akin to arguing against gravity. In Darwin’s day much of this evidence came from similarities of anatomy and the fossil record. These days the record from fossils is voluminous, with each find being completely consistent with what we would expect if species had evolved. (For example, it would take just one vertebrate fossil to be found in Permian rocks to overthrow the entire evolutionary edifice! No such counter-evidence has ever been found.). But the main body of evidence is from a source unimagined even by Darwin... genetics. Or, more specifically, through examining the stuff of which genes are made... DNA.

The whole study of modern Biology - from microbiology to population ecology, from anatomy to taxonomy - only makes sense when viewed with an evolutionary perspective. Before this understanding, Biology was merely the collecting of “curiosities”, with no viable mechanism to explain why they living things looked or behaved as they did, or why they were found where they were found. Understanding that every living thing, extant or extinct, is related through an intricately tangled “tree of life” to every other living thing provides an explanation for virtually every biological observation ever made. It explains, for example, the otherwise extraordinary fact that 50% of our DNA is identical to that of a cabbage!

This last fact alone is completely consistent with the prediction from evolutionary theory that cabbages and humans once shared a common ancestor, one descendent of which went on to evolve into plants such as the cabbage, while another lay at the base of the branch that evolved into the myriad species of animals, most of which are now long extinct, but one of which survives today as *Homo sapiens*... and that over the intervening millions of years roughly 50% of the DNA blueprint that specified the form and function of that ancestral organism has been retained, to still be present in both cabbage and human.

A crucial prediction of the evolutionary theory was that the more distantly related two organisms are then the less in common will be their DNA content. As we now analyse the genomes of more and more organisms, and correlate them with other evidence from taxonomy, comparative anatomy and, of course, the fossil record and the Earth's geological past, we discover that this is indeed the case. Humans, for example share 99% of their DNA with chimps, with whom we shared a relatively recent common ancestor, but only 40% of our DNA with bacteria with whom we shared a particularly ancient common ancestor... much earlier even than our "cabbage" ancestor.

So, there is almost universal agreement among Biologists that evolution clearly happened, and continues to happen. Given the incredible complexity of the details of this evolution and the huge time frame over which it happens, however, it is not surprising that not every scientist agrees on the details of the mechanism that drives these changes. Of course, the main contender for this mechanism is Natural Selection, proposed a century and a half ago by Darwin and Wallace, and still capable of explaining much of what we have observed of the living world ever since.

In its essence Natural Selection is pretty simple to visualise... and once the blinkered distractions of religious prejudice and its supernatural creation myths are removed, it becomes almost self-evident. All it proposes is that many more offspring are born than survive to reproduce, that all offspring differ genetically from one another (and their parents) and that some of these differences may confer a survival advantage on that offspring, making it more likely to pass that particular genetic advantage on to succeeding generations. That's all there is to it, really. You clearly have inherited a mixture of genes from your parents, and, unless you are an identical twin, you clearly contain a different mixture than your brothers, sisters and parents. And it is pretty obvious that a large component of our ability to successfully live and reproduce is contained within our particular genetic make-up.

For Natural Selection to affect the course of evolution you need two main ingredients... a source of genetic variation and plenty of time. The main sources of genetic variation is mutation (which actually changes the DNA) and sexual reproduction (and viral injection and gene exchange in microorganisms) which mixes up the clumps of DNA, called genes. And, given that the Earth was formed over 4 billion years ago and living things were present soon after, life has had an enormously long time to reshuffle and add to this DNA to yield the variety of organisms that we see around us today, not to mention the millions more that the fossil record reveals to have lived in the past.

Of course, no organism is perfect. Natural Selection doesn't "seek" perfection. Natural Selection is completely aimless. It acts only on the present, with no eye to the future. The only "progress"

we observe in the development of life is merely a reflection of the constantly waging “arms war” where no organism evolves in isolation but is surrounded by other organisms also being selected to maximise the chances of their genes being passed on, sometimes at its expense, sometimes to its benefit. What conferred a survival advantage in one environment may cease to be relevant as the environment (including, of course, other evolving organisms) changes. As long as your mix of genes gives you a survival advantage over those with different mixes, then the next generation has a better chance of containing those genes. Thus all organisms carry heaps of “legacy” genetic material... strands of DNA that may once have served a purpose in our ancestors, living in a particular environment, but in the different environment of today are no longer useful. Such strands (which, in fact, make up the majority of our DNA) therefore reveal more about their origin and our evolutionary history than their current purpose. And undoubtedly there have been countless situations in the past where survival depends purely on chance than on genetic mix... no matter how effectively your gene mix has adapted you, it won't protect you against a catastrophic meteor strike or volcanic explosion!

It is considerations such as these that lead me to cringe slightly when people ignorant of the process of evolution (and even many who should know better) describe humans as the “pinnacle” of evolution, or that today's organisms are “more advanced” than their ancestors who are often denigrated as “more primitive”. And certainly no organism, past or present, could ever be considered “perfect”. Natural Selection yields organisms that are “good enough”, not perfect. They just have to be slightly better than their competitors to survive... and insofar as the organism successfully survives it can be considered as "evolved" as any other... the bacterium living in your gut can, in this way, be considered no more "primitive" than you. It and you are both at the tips of their branches on the evolutionary tree.

Other misunderstandings around evolution abound... for example the concept of a species formation. Some people, often driven by a desire to reconcile their imaginary beliefs with the realities of scientific discovery, seem willing to accept that evolution occurs within a species, allowing each species to have a common origin, but cannot accept the shared ancestry of all species. This misconception was boosted by the early confusion surrounding the definition of a “species” when all "Naturalists" had to help them catalog the world's living things were their outward appearance, which was used to classify them into Families, Genera, Species, Races, etc. It amazes me how accurate most of this taxonomy was, given how little they had to go on. Now we see organisms as the product of their particular mix of DNA we not only use this knowledge to make detailed adjustments to the taxonomists' phylogenetic tree of life, but we can redefine the category of “species” in terms of this genetic mix.

Viewed through the evolutionist's eyes, a group of organisms is called a species if the members of that group can successfully mix their DNA and produce similarly fertile offspring. If, however,

the DNA of two organisms from different groups cannot (naturally) mix and produce fertile offspring, then they are defined as being from separate species. So, for Natural Selection to yield a new species, all that is required is enough time for enough changes to accumulate in its DNA for it to be no longer able to successfully mix its DNA with any other group... even though they may share a recent common ancestor. Seen this way, the term “species” is a convenient label humans have placed on groups of organisms, plucked from the continuum of their evolutionary lineage. Through the aimless eyes of Natural Selection, the division of “species” exists along a continuum of accumulated changes to the DNA... a point which crosses into a new species only when the changes to the DNA are enough to make mixing with another group impossible. Speciation is exactly the same process that makes you different from your parents, only extended over enough generations for enough differences in your DNA to accumulate until it becomes incompatible with the ancestral DNA. At this point you can then be labelled as a separate species.

Richard Dawkins presents a vivid metaphor for this process by imagining each generation pasting their picture in a gigantic family album. The genetic differences between one generation and the next are so minimal that they are hardly noticeable... and the children of each generation quite rightly considers themselves to be of the same “species” as their parent. These genetic changes, however, are subject to the subtle pressures exerted by Natural Selection, causing the genetic mixture that is you to be little different from your father, but considerably different from your Great-Great-Great...Great-Grandfather. So different, in fact, that if we flipped back through our family album to two million generations ago, our grandfather would look very much like a monkey, and would very clearly be defined as a separate species. Go back for two hundred million generations and our ancestor looked like a lizard (who would also be the ancestor of all other reptiles and mammals). Many more millions of generations before that and we arrive at the picture of someone who is clearly a fish. And, if our family album were large enough we could continue this process way back to the ancestor we shared with the cabbage.

The interesting thing is, however... at each page of this family album the children would have quite rightly considered themselves to be the same species as their parents. The changes from one generation to the next are so small as to go unnoticed. Jump by thousands of generations and the accumulation of gradual changes become very noticeable. Hence the concept of “species” is just picking points in this continuum where we can happily apply the label. In reality, living within the continuum of evolutionary time means the changes are hardly noticeable from one generation to the next. Quite obviously an ancestral chimpanzee-like animal didn’t suddenly give birth to a new species of hominid... she, like every other mother throughout time, gave birth to a child that varied only minimally to herself.

This view makes the search for “missing links” somewhat misleading. Every organism that ever lived can be considered a “missing link”... assuming, of course that it lived long enough and had

the opportunity (or desire!) to pass on its genes. So every fossil of any adult organism ever dug from the earth can be rightly considered as a link in this gigantic multi-branching chain of evolutionary change. (Of course every extant organism - including you - can similarly be considered a link in this evolutionary chain!) In most cases, the fossil record tells us, these chains eventually came to an end... most animal or plant species go extinct. Only a very few still retain their links right up to today. Our species, for example, clings onto the very end of one of these branches, just as every other species has at one time or other.