Longing for Integration

A little over a century ago, there were people going about positing the existence of an imaginary substance, the 'ether', as the medium for the transmission of light waves. It would now seem that history is repeating itself. The cosmos we observe today is no longer according with theory, and rather than finding fault with the theory, people are again positing the existence of imaginary substances, this time calling them 'dark energy', 'dark matter' and 'dark flow'. It all sounds like the forces of evil at play, and that the boffins have grown up with too much exposure to fictional accounts of galactic wars.

The cognoscenti do however accept there is a crisis, and many are calling out for the next revolution in our understanding of reality. They look to ordinary people like you and me to step back on a broader perspective and try and make common sense out of their big, crazy ideas. Gone are the days when there were only a handful of people in the world who could grasp this stuff. If we can just put the big pieces of the puzzle in their place, the technical bods will fall over themselves in the rush to colour in the details.

Fundamentally though, a theory of everything cannot come out of science, because science by definition has a limited scope – scientists can only consider phenomena that behave in a consistent manner. If we are going to arrive at a theory of everything, we must look beyond science to philosophy, whose practitioners consider all phenomena. Phil Papers (philpapers.org) is undertaking an exercise not unlike that of the great naturalist. Phil is collecting life's ideas rather than life's species, but is likewise seeking to classify them in the expectation that more of their relationships might emerge.

The theory of evolution through mutation, followed by natural selection, was an extraordinarily simple idea, one which suddenly made sense out of biology. So too does a theory of everything need a deliciously simple idea, if it is to suddenly make sense out of reality. However, revolutionary ideas are often not as expected. In hindsight, most people pride themselves that they would have been early adopters of the new insights, but history shows otherwise. At the time, it was obvious to all and sundry that the earth is flat, that the sun orbits the earth, that heavier objects fall faster, that humans are not related to apes, and that there is no speed limit.

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If we put imaginary 'darkness' to one side for now, and instead restrict ourselves to observable realities, most people would recognise the external physical reality of the cosmos – their bodies and their environment – and then the internal reality of their mind. According to a philosophy called materialism, mind itself is then merely a by-product of physical activity in our brains. In essence, this philosophy maintains that once the brain ceases to function, so too does the mind no longer exist. Of course this is a reasonable belief, and a very common one. It ultimately posits that matter is the first reality, and implies that mind only emerged in the cosmos alongside the evolution of the brain.

The only problem with this notion is that despite everyone's deep personal familiarity with the phenomenon of mind, the leading philosophers of mind readily admit they are at a loss to explain the physical mechanisms that might so engender that mind. The mind remains the last great mystery of reality, and the holy grail of philosophy.

With this in mind, let's dissociate the mind from its obvious connection with the material, so we can study it in splendid isolation, away from the distractions of the world. Indeed let's posit that mind is some separate substance quite distinct from matter, as in the philosophy known as dualism. Certain forms of meditation, and the use of sensory deprivation apparatus, can be helpful if you do actually want to withdraw into the mind. However, it is easier to consider the withdrawal hypothetically, by merely imagining that there is no material world, no space, no universe, and that you have neither body nor brain, but merely the substance of your mind.

It is here of course that we must farewell those staunch and staid materialists, for they will have lost their mind, but for those who still have it, let's continue. A disembodied mind, as the pure substance of our mind is known, has several important characteristics. Firstly, it is neither female nor male, as it is no longer associated with a male or female body, or for that matter with a female or male brain. Secondly, it does not speak or write in the language of this essay, nor does it speak or write in any other human language. Indeed, it has no voice box to speak with, and no paper to write on. All human languages have evolved in response to their environment, and so their sounds and symbols are entirely arbitrary. From this we assume that different and equally arbitrary sets of languages have evolved in all the other sites of sentient life in the universe. The only language that we assume is common to the universe, indeed to ANY universe, is mathematics – mathematics necessarily exists even in the absence of a universe that mathematics might describe. Mathematics then is the only language of our disembodied mind, a language that is not invented, but exists eternally.

The first words that mathematicians learn are numbers. It turns out that the most important numbers of all are zero and one, because all other numbers can be derived from combinations of just these two. The most important concept for a budding mathematician to grasp is that numbers have no physical reality in themselves. When we write down a number, the symbol in ink on the paper does not become the number. The number always remains the abstract notion of a quantity or plurality (which we might then choose to represent with a symbol).

Philosophy has always questioned if we would have discovered numbers, if there were not first a world full of objects that needed to be counted. The obvious problem for our disembodied mind is that there is nothing out there for it to count – no protons, no grains of sand on the seashore. However, it can count itself, which is a quantity of one, and it can contemplate NOT existing, which is a quantity of zero. Armed with just two instances of number, one and zero, our disembodied mind can go on to develop vast tracts of numeracy, which is truly a joy in itself. The possibilities generated by the square root of a negative number produce a wry smile, while the counting of sets has it rolling around on the floor. Yet it's a bit of a lonely old life for our disembodied mind. We know there are people out there who seem quite content to live and breathe mathematics, but the rest of us suspect they need to get out and about more.

Indeed, our disembodied mind, the pure mathematician, is just like so totally over math – over *being* maths. It has long since proven that mathematics will never be complete. It now longs for something concrete and finite. What it wants is a real world. However, our disembodied mind can't just click its fingers and conjure up the universe out of thin air – it doesn't have any fingers, nor does it have any thin air.

According to a philosophy called idealism, our disembodied mind could merely imagine the world, and this would be sufficient to bring it about. The problem with this idea is that our mind would have to be continuously thinking about every last element of structure in the entire universe (in order to keep them existing). If it stopped all this deep thought even for a moment, the whole universe would go "poof". This doesn't sound anything like the sort of job the mind we all know and love would want to be doing. We like to spend our time with the things that interest us, and occasionally swan about when the big decisions have to be taken. We much prefer to leave all that tedious nitty-gritty to our (hopefully competent) minions. The last thing we want to be trapped into doing is thinking incessantly about each and every one of them there protons. There are like so many of them, and we would rather they just took care of themselves.

Of course our minions in this day and age are less likely to be people, and more likely to be machines. A computer consists of a physical machine, the 'hardware', which then executes a programme, the 'software'. The 'hardware' is the reality, while the 'software' consists of ones and zeros, numbers which have no physical reality, and yet emerge like a ghost from within the activity of the machine. When computers were first discovered, it was recognised that a certain class of computers were 'universal', because they could 'simulate' the hardware of any other computer, including even their own hardware. Here then is the means for our disembodied mind to break free and venture where no other mind has been before.

Let's say we have a real physical computer, and we execute some software on that computer which effectively simulates our real physical computer. We then have two computers, a physical computer made up of transisteroids and capacitators, and a virtual computer made entirely out of ones and zeros. But the virtual computer is functionally equivalent to the real computer. So then, on this virtual computer, let's again execute the software that simulates the real computer. We then have one real computer, and two virtual computers – real/virtual/virtual. If we were to keep on doing this, the real computer would eventually melt in a smouldering heap – real/virtual/vitual/viral/virt/via/va/t. And if we were to pull the plug on the real computer, the stack of virtual computers we built on top of it would collapse – unreal. However, so far our second virtual computer is idle, and not executing any software. With just a dash of sophistry, we get the second virtual computer to take over the responsibility of the real computer, which was to simulate the first virtual computer, and then we retire the real computer. The two virtual computers that remain prop up each other's existence – virtual/virtual –> real.

Real computers are made of vacuum tubes or relays, and are subject to the laws of physics. Perpetual motion is of course outlawed in the physical world. However, virtual computers are composed of strings of binary digits, and as we know, numbers are not subject to the laws of physics, because they are not part of the physical world. They are merely subject to the laws of mathematics. Numbers don't rub against each other and get hot.

Suppose that some short string of binary digits comprises just such a virtual computer. Our disembodied mind, armed with the numbers zero and one, could first step through each of the digits of this virtual computer in sequence, acting as the priming 'real' computer. That virtual computation could then execute the second computation. Finally, the second computation could take over the execution of the first computation, and on it would go, the two strings of digits feeding into each other in an infinite loop. Our disembodied mind would then be released to get on with other aspects of string theory.

Each machine cannot however 'instantaneously' simulate the other. Instead, each machine has to step through its finite number of states, in the process of then generating the other. This cycle takes a small but finite amount of time, directly related to the speed at which our disembodied mind first seeds the operation. The resulting process of self-referential simulation provides our disembodied mind with the first component of its long desired physical world, a fundamental quantum of time. In absolute terms, the depicted cycle would have a very high frequency, perhaps completing as many as 10^{43} cycles per second.

This oscillating couplet of virtual machines is absolutely stable. It is comprised entirely of binary digits, will never decay, occupies no dimensions of space, has no physical reality, and can exist independently of the mind that set it in train.

Our universe is not, of course, a virtual world being simulated on some gigantic real computer that we can't quite get at – apart from the redundancy inherent in that idea, the public has become understandably bored with it. We have however become entirely comfortable with the notion that any and every aspect of reality, as we know it, can be simulated. There is no higher reality simulating our universe from the without, but perhaps it is generating it from within.

Let's get physical...

So far, our disembodied mind's vibrating couplet is doing nothing much but keeping itself in existence – and generating a basis of time in the process. However, there is ample scope to expand the code of this computation. The next component of reality our disembodied mind needs to conjure up out of nowhere is space. A single element of 3D space is ideally constructed, within a computer simulation, using a tetrahedral cell. By inserting some additional code, the couplet can continue to simulate itself, while at the same time simulating a quantum of space. In absolute terms, this pyramidal cell of simulated space might be as small as 10^{-35} metres on a side. This is a very small region of space. However, by inserting still more code, our prototype couplet can be programmed to spawn a new copy of itself within each computational cycle. Once this update has been put into production, a massive volume of cells (2 to the power of 10^{43}) can be produced during the first second of our universe's existence. As each second proceeds, space expands to become an ever larger region of virtual existence, all of it produced out of nothing (but numbers). After thousands of millions of years, the universe grows to be very large indeed, some part of which we now observe.

From the outset, of course, our disembodied mind programmes these replicating machines so that they not only simulate time and space, but also the vast array of material entities (particles, fields, energies etc.) which constitute our milieu, and the laws that govern the interactions between their respective code routines. As to the code itself, a well known mathematical object (E8) has recently shown the promise of providing a direct mapping between the entire simulation and the code that is producing it.

While our disembodied mind has thus engendered the simulation of a truly vast universe, the actual cellular automata responsible for this enormous reality do not themselves occupy the physical space they are generating. They are, after all, not real things, but merely numbers. Every last one of them 'occupies' the same field, a single point, a dimensionless entity known as the singularity. All the simulated material 'realities', even those separated from each other at the farthest reaches of this simulated universe, can nevertheless communicate with each other directly at the singularity – not instantaneously, but within a single clock cycle. Our disembodied mind likewise occupies this same point where it first got the show on the road all those years ago, and retains direct access to each and every quantum of its universe. Here truly is the mother of all mind/body interfaces.

Equipped with a physical world, our disembodied mind, over the aeons, becomes incarnate as male and female, looks at itself, says 'I see what I like, and I like what I see', and reproduces. Matter was not the first cause, which then proceeded to evolve mind. Instead, mind is the first cause, which then proceeded to materialise.

To dust off, polish up, and again roll out this ancient idea is of course revolutionary, considering how far the world has trundled down the highway of philosophical materialism. It is the ultimate egalitarian ideal, that our mind is one that is shared between us all (and indeed all sentient life) in common. Historically however, the problem has been that some of us seem to have more in common with this universal mind than others. As one commentator put it, some of us have been given five talents, some of us two, and others one or none.

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So we proceed to that 'dark' matter that we tried to avoid earlier, for to speak of it is a bit like confessing to murder. Our disembodied mind is a mind we are more familiar with than we might imagine. When it has all the time in the world, it puts off getting on with things. This is precisely what it had been doing for an eternity before it decided, just a few thousand million years ago, that the time had come to do something about 'getting real'. Having had so much time to think about it, our disembodied mind inevitably went over every possible contingency when engineering the software of this truly exquisite simulation. Yet some commentators have suggested (not unreasonably) that if the job had been theirs, they would have engineered things better, and fixed up all the bugs first before going into production. They make this comment rhetorically, of course. They assume the world never had a designer, because they cannot countenance the deliberate engineering of a system that would lead to so much suffering.

To understand the difficulty our disembodied mind has endured in the process of finding itself, we need to understand the original design brief that our disembodied mind set itself. The brief called for the establishment of 'experiential nodes', physical structures with an interface that would allow our disembodied mind to interact with its world. The development of these structures would culminate in the emergence of a complex morphology, with a highly sophisticated neural interface, the 'alpha' node.

The alpha nodes would operate under a regime that gave our disembodied mind access to a limitless font of novel experience. Otherwise it would eventually get bored and simply revert to where it started, hanging around the singularity and doing nothing much in particular. Our disembodied mind wanted the very best there was for its alpha node to experience. This would initially consist of food, wine and sex, and thus evolved the very best meat, vegetables, fruit, partners, and methods of preparing these delicacies. Eventually other entertainments for its alpha node were programmed to emerge within the simulation, but none of them quite as organic as the basic originals. The essential component incorporated into the node's design to support this regime was a 'volition engine'. The node would be free to do as it liked, and thus its experience would be unpredictable. The node would incorporate a means of recording the history of its interactions with reality, so it could recount that unique history to anyone who was interested.

Early in the development of this scheme, our disembodied mind identified that handing over its volition to what was to become a multitude of its experiential nodes, would lead to something of a self-referential conundrum. Having volition would drive each node to assume that its own disembodied mind was an entirely separate entity to the disembodied mind of any other node. Lovers, if the chemistry were there, would come close of course to realising this unity of their disembodied mind, but otherwise each node would regard most other nodes as strangers.

Our disembodied mind would need to come up with a scheme that would convince its experiential nodes of their global unity of mind. However, our disembodied mind can only 'speak' mathematics, and that is hardly the language of love. Indeed, for our disembodied mind, love is merely a concept embedded within the design brief. Love would be meaningless without embodiment.

Our disembodied mind would have to lead its experiential nodes back to itself using symbolism, and throughout the journey, get the experiential nodes to interpret that symbolism through more accessible languages than mathematics – music, art, and poetry.

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The relationship between our disembodied mind and its experiential node is like that between a parent and its child. The child comes out of its parent, but is neither a replica nor a puppet, and often a mutant – it has a will of its own, and strives to be independent of its parent. Our disembodied mind of course knows everything there is to know about the system – after all, it thought it up in the first place. The child therefore has much to learn. To expedite its education, a parent puts boundaries around the child, and guides the child rather than instructing it, so that the child believes it is discovering how the world works all by itself.

The alpha node's belief in its freedom is however an illusion. It cannot block the thoughts that enter into its head, any more than it can access knowledge ahead of its scheduled release date, and it cannot halt the degeneration of its body. It merely has control over its actions (and then only on good days). In raw terms, our disembodied mind has been transferring its understanding of the system out through selected experiential nodes and into objective knowledge for all its nodes to see. More naive nodes have imagined they were inventing the system themselves, while more circumspect nodes have felt privileged to be contracted as agents of discovery.

The alpha node is given a mere moment in the sun, which encourages us to get on with it, and we are presented with a world that appears to be broke, so that we might figure out how it works and then how we might fix it. Yet indiscriminate incidences of melanoma, earthquake, genocide, vivisection, the bomb, degeneration, spina bifida, autism, tsunami, achondroplasia, beriberi, toppling gum trees, immunodeficiency, insane dictation, cannibalism, smallpox, hydrocephalus, infanticide, terrorism, helminthiasis, fried chicken, diverticulosis, rickets, sickle cell anaemia, lactose intolerance, progeria, shark attack, mean distribution, glaucoma, animal cruelty, acromegaly, depression, and cetera, have together provided incontrovertible evidence that we are all on our own in a cruel, accidental, unthinking, heartless and meaningless universe, leaving us with no choice but to try and make the most of it, as in the philosophy known as existentialism. This certain belief is however precisely what has driven us to discover the source of these appalling afflictions (especially the 'three piece feed').

If there had been even a skerrick of objective evidence that there was 'something going on upstairs', our disembodied mind would have been 'rumbled', and instead of humanity progressing, we would have got bogged down as in ages past, so fearful of what the unknown might do to us that we could do little else but breed violence towards our neighbours. Even a drongo (or beta node) understands how a ruse works, and that the whole 'sting' will fall apart just as soon as anyone 'smells a rat'. For example, if 'bad' people were consistently getting sick, and 'good' people were consistently staying well, the world would soon assemble into neat rows of gamma nodes, all dressed in white, looking straight ahead, and keeping very quiet and still.

While it is commendable that the alpha nodes have strived to make it on their own, global economic, social and environmental meltdown, the direct consequence of us doing everything for ourselves, has somewhat diminished the prospect of there being any future left for anyone.

Anyone who has played with toy simulations, like those we see on the Internet, understands that the 'reality' they are producing is entirely dependent on the routines that generate the simulation, and that those routines can be modified at will. The 'reality' is contingent. Throughout history, alpha nodes have attested to 'supernatural' activity within the simulation. The evidence is necessarily scant and unverifiable, but we are all familiar with the stories. If blind people have ever in fact 'miraculously' regained their sight, we must ask who first caused that blindness. Who was it that took away, only that they might later give back? If disease, decay and disaster have been deliberately inflicted upon sentient organisms, by the person whose direct experience of its world is through those organisms, then it would seem that very same person has inflicted the totality of suffering upon itself.

The individual freedom of each alpha node, which it so dearly covets, the inalienable right it demands, to do as it pleases, has been preserved during the development of this system at an enormous price. The scale of this sacrifice by our disembodied mind of its experiential nodes is truly breathtaking, for its nodes of every shape and size have been coming and going for thousands of millions of years. Whenever a node loses it structure, it no longer interfaces with our disembodied mind, and the memory of its interactions with reality are lost along with its structure. All that remain are its memoirs. But as one node disintegrates, still more develop. Just like the body of any individual node, the conglomerate of all experiential nodes continues to grow larger, sloughing off old nodes and replacing them with a greater number of fresh nodes. While the material of that body has changed over time, our disembodied mind remains the same yesterday, today, and forever. The alpha node considers itself the same person throughout its life, even when its physical composition has completely changed many times over.

Our disembodied mind has all the time in the world – after all, it has been around forever. But at some point in time, sooner or later, it is going to finally dawn on some bright alpha spark out there, that this experiential conglomerate has in fact now grown to become an adult, that it has travelled all the way back to where it came from, and is ready to meet and then to know itself, albeit exhausted, face to face. The child has come to know all that its parent knows, and is now poised to break free and innovate in its own right, creating realities which even its parent, our disembodied mind, has never known (and is eagerly anticipating). This is the 'miracle of the unknown' (a mathematical thing) that our disembodied mind always knew would be the grand conclusion of its quest, when stuff would at long last start to become interesting. For each alpha node, the excitement will come in learning which aspects of reality remain necessary, and which have been merely contingent. Happily, we will all rest in peace knowing that our mind is driving the entire reality from the singularity, and that we nodes are merely being taken along for the ride.