

What Might Be Is

Anatoly Karlin

[Published at SublimeOblivion.com (2009). (First version: January 2009)]

This is the first in a series of philosophical essays in which I outline my philosophy of *Sublime Oblivion*. Here I demonstrate the indivisibility of the material and Platonic worlds and show that our universe is almost certainly a computer simulation nested within an abstract computer program or simulacrum. The consequences of these results are explored.

Modern natural science has a lot to be proud of. Technology follows in its wake. The horizons of human consciousness retreat before its implacable incandescence. Its defining trait, reason, affirms freedom¹. Yet it is ultimately disappointing and dehumanizing. It heralds the death of God, of struggle and belief in good and evil, while in atonement for deicide, deigns to offer only models of reality that approach but never reach union with it. Thus we come to an impasse, the fatal double dilemma that drove Kierkegaard to despair, Nietzsche to madness and Camus to an 'acceptance without resignation' – though I personally can't imagine Sisyphus happy².

All the arguments for God's existence that I know of sink under one paradox or another – cosmology through infinite regression, ontology through elementary logic and teleology through evolution. Constructing an equivalence between Nature or reality, and God, is nothing more than an exercise in tautology dating from Spinoza and as such tantamount to atheism. Those who cite Darwinian evolution or Hegelian dialectics as *the* answer do not realize that they are nothing more than a *Mechanism*, as hopeless as traditional objects of belief at explaining the deepest metaphysical questions. In despair over the power of pure positivism to rationalize existence, let us make a bold conjecture and make the axiomatic assertion that all that might be, is.

According to Plato, there exists a separate world of 'perfect forms' or 'universals' that is the highest and most fundamental reality; our world contains but their imperfect imitations. This concept can be best explained through mathematics. Even if some global cataclysm were to wipe out humanity, the Theorem of Pythagoras will linger on unperturbed on some transcendent plane, ripe for the picking by the next species to evolve abstract reasoning skills. This is because the squares of the shorter sides of a right-angled triangle will always equal the square of the longer side under Euclidean geometry. I will call this Platonic realm the Void³, for it is indeed void; it is an abstract, all-encompassing region of nothingness, zero and infinity. All possible mathematical objects and their unions exist in the Void.

There exists an interesting class of mathematical constructs known as 'cellular automata'⁴. These are regular grids of cells, each in one of a finite amount of states, in a finite number of dimensions. The dimension of time is also discrete, with the state of any particular cell at time t a function of the states of the cells in its 'neighborhood' at time $t - 1$. This function is based on fixed rules

-
- 1 Fukuyama (1992), *The End of History and the Last Man*. Argues that the dialectics of technological progress lead to an end of history culminating in liberal democracy.
 - 2 Camus (1942), *The Myth of Sisyphus*. For his transgressions against godly authority, Sisyphus was condemned to forever roll a rock up a mountain, only to have it roll back down and start over again in an infinite loop. It is a very appropriate metaphor for one of the representations of *Sublime Oblivion*.
 - 3 The Void, also called the Eldest Dark or the Everlasting Dark, is an abstract region of nothingness existing outside the Timeless Halls, Arda and all of Eä in Tolkien's Middle-Earth cosmology.
 - 4 Wolfram (2002), *A New Kind of Science* shows how very simple programs can replicate the behavior of many different complex systems via emergence. The idea of a digital physics dates back to Konrad Zuse (1969), *Rechner Raum*.

and has an undetermined outcome. What makes cellular automata intriguing is how some of them can generate order and complexity out of initial chaos⁵, thus reflecting the meta-narrative of our own universal evolution from a soup of primitive particles to industrial civilization. Although most cellular automata exhibit only simple repetition or rampant randomness, a special few demonstrate an interesting, uninterrupted interplay between order and chaos. Conway's 'Game of Life' generates stable patterns which exhibit themselves amidst disorder, thus fulfilling a very general definition of life as a localized, self-sustaining concentration of ordered complexity⁶. The most philosophically significant is Wolfram's Rule 110, which produces complex, non-repeating patterns and was proven to be computationally universal, i.e. theoretically capable of performing any computable task. Furthermore, these behaviors demonstrated by cellular automata are replicated by many classes of other simple computer programs, and as such have a strong claim to universality.

One of the most important paradigm shifts of the Scientific Revolution was the gradual rejection of the Aristotelian theory that matter was continuous and elemental. The ancient Greek and Chinese conception of the world as a melange of Earth, Water, Fire, Air and Ether was displaced by theories that space-time was made up of discrete if very small units – corpuscular cells, atomistic molecules, 'chronon' time. Through its centennial, dialectical procedure of postulation, refutation and synthesis, science arrived at the fundamental limits to observation into the worlds that lie hidden within Planck distances and in between Planck time. Our universe is capable of evolving patterns amidst chaos that are sophisticated enough to recognize them as such, if not fully understand them – the proof is in front of (or rather, behind) our noses. Although continuous mathematics is used to explain the vast majority of natural processes, its inadequacies are protected from exposure because the universe operates with discrete quanta that are *small* from a human perspective. Modern quantum mechanics, with its chaotic 'soup' of sub-atomic particles, offers a glimpse beyond analog delusions into discrete reality. In cellular automata, the states of all cells affect every other cell, which is a perfect metaphor for the fundamental problems in measuring quantum phenomena.

We know by the anthropic principle that the universe exhibits an evolutionary mechanism that resulted in an increase in ordered complexity amidst chaos. Science showed that the universe's primitive expressions are discrete and as such can be subject to manipulation by a set of rules, which we'll call the Pattern. Since there exist universally computational mathematical objects that also fulfill the above criteria, we can conclude that whether or not the universe is based on superstrings, a holograph or something else is ultimately irrelevant – the overriding premise is that it is 'computing itself...as it computes, it maps out its own space-time geometry to the ultimate precision allowed by the laws of physics. Computation is existence'⁷.

Thus viewing our universe as a universal cellular automaton makes it, in effect, a mathematical object, and hence part of the Void. But in that case, how could it be real? After all, the world as we perceive it is only a pale imitation, and hence inferior, to the perfect world of forms. Take the circle, defined as a finitely long straight line rotated completely around a locus on two-dimensional Euclidean space. Such a circle exists within the Void, yet no artisan, and not even the most advanced robot, can ever replicate it. It is impossible in principle, for it would require the computation of Π to an infinite amount of decimal places; a task clearly impossible within the rigidly finite, discrete confines of any

5 Some definitions. Information is organized measurements (data if unorganized). Complexity, or the AIC (algorithmic information content) is the "length of the shortest program that will cause a standard universal computer to print out the string of bits and then halt", according to Murray Gell-Mann. Order is how well the complexity fits a purpose.

6 <http://www.ibiblio.org/lifepatterns/> has a big sample of such games.

7 Lloyd and Jack Ng, "Black Hole Computers", *Scientific American* (Nov 2004), pp.53-61

cellular automaton, which put limits on its maximum possible computing power. Our existential prison of pixels precludes the perception of continuous perfect forms.

However, by accepting that our universe is a discrete Tapestry, we resolve the paradox. If such a construct exists within the Void, it is equivalent to the world we perceive to be reality. In a sense, the Void fulfills all the criteria of God. Null and unity, it transcends the human imagination, for human minds are finite in scope. It sidesteps the 'who created the creator?' paradox, for it *is*. And was, and will be, though being outside Time, its directionality is meaningless. It is zero and infinity of cardinal infinity. What might be, is. All possible computations, exist, and are their own simulacra⁸.

Several consequences follow from this. One is that consciousness is a construct, for the mind is mere matter in a state of highly ordered complexity. The way in which we 'agents' perceive the world evolved and emerged as a result of the original biological urge towards self-preservation and replication of the patterns encoded in our genetic makeup. To maximize our prehistoric utility function, mainly defined by the above urge, humanity refined its consciousness – subjectivity, sentience and self-awareness – until it became a hardwired belief. The development of abstract reasoning skills partially divorced humanity from its primal nature and made possible the gradual deconstruction of this belief. From Leibniz's assertion that 'if you could blow up the brain to the size of a mill and walk about inside, you would not find consciousness', to the concept of an objective Turing test⁹ for its presence, the grounds for a subjective interpretation of consciousness were demolished. The philosopher Douglas Hofstadter visualizes consciousness as a recursively self-calling 'strange loop'¹⁰ in computational terms; henceforth, a soul.

Kant argued in his 'Critique of Pure Reason' that space and time, rather than being things-in-themselves, are just forms of intuition by which we perceive objects, i.e. the medium through which we sense and experience the noumenal world, and the precondition for an object to have appearance. This is the reason why we experience time at the pace that we do, perceive only three dimensions out of the theorized eleven and see only a very narrow bandwidth of the electromagnetic spectrum, which we anthropocentrically define to be 'visible'. Hence, by designating souls as emergent patterns, capable of being simulated by discrete information processes, it is possible to unify reality and the transcendent; our universe becomes a (infinitesimal) subset of all possible universes.

Science continues to disappoint, approaching but never reaching union with reality. The long-sought 'theory of everything' for physics is unattainable. We may with time be able to figure out the Pattern of our simulation in full detail, since the rules by which a program runs can be quite simple even if the program produces very complex results. However this would not be a theory, since theories require predictions that can be empirically confirmed. For the only way to find out the outcome of a cellular automaton is to run it. But *it is already running itself*; therefore, even if we could speed up its execution (which we can't, since all the calculating space we are using is being used to compute us), only an observer outside our Tapestry will find out what happens faster. For everyone this Tapestry, time will go on at the same pace regardless of the speed with which the universe is being processed since their time is discrete and contained within their Tapestry (our conception of time as an analog flow is a nothing more than an evolutionary adaptation of a means to perceive the world). A theory of everything implies knowing the mind of God – and even He may only view the future in retrospect.

8 Baudrillard (1985), *Simulacra and Simulation*. Our only difference is that he believes reality once existed, while my doctrine affirms an eternal hyper-reality.

9 In a Turing test, a human judge has many conversations with a machine and another human. If she cannot reliably identify which is which, the machine passes and is ascribed consciousness.

10 Hofstadter (2007), *I am a Strange Loop*.

Physicists noticed that the underlying laws of our universe are especially 'fine-tuned' for the evolution of life. For instance, if the strong force were slightly stronger, stars would burn out in minutes; if it were slightly weaker, elements like the hydrogen isotope deuterium would not be able to hold together. The analogy with cellular automata is clear and uncanny – while a vast majority of Patterns or sets of rules produce uninteresting results (equivalent to universes that collapse or tear apart before evolving concentrations of interesting, ordered complexity), a few are interesting, unpredictable and non-random (equivalent to our Tapestry).

Some theologians claim 'fine-tuning' proves the existence of a Creator-God or at least 'intelligent design'. There exist two counter-arguments. The standard one is that our existence as sapient observers in this universe imposes certain constraints on the kind of universe we *can* observe, due to the anthropic principle. The second one is specific to my view of reality as immaterial computation. Firstly, consider that this God would have emerged in one of two possible ways: a) via evolution and b) via appearance. The former case implies the existence of another (fine-tuned) universe that evolved an entity with the computational capacity to simulate our own 'virtual' universe. Although this is a real possibility that we'll discuss below, few would regard this mother of all supercomputers as God. (An interesting consequence is that if one insists on such a definition anyway, then humanity has a real chance of becoming Gods themselves this century after a technological singularity¹¹).

The latter case is a theoretical possibility, but the probability that a discrete entity capable of simulating our universe, and hence greater than it, simply appeared fully formed out of the Void instead of evolving according to a Pattern is extremely low (though since the Void contains all possible mathematical objects, such entities do exist). Nonetheless, we can cut out this possibility with Occam's razor – and even if it gets stuck in the wood, there would still be no reason to regard the appeared but still discrete God as qualitatively different from the evolved God. Arthur C. Clarke once claimed that “any sufficiently advanced technology is indistinguishable from magic”. Similarly, it can be argued that any being of sufficiently high ordered complexity is indistinguishable from God.

Thus there are two possibilities – either our universe is a standalone program within the Void and potentially its own God, or it is being simulated by a higher God. In the latter case, all the computations required to run our simulation are under Its total control, including our continued existence. And according to a theory proposed by Nick Bostrom, the chances that we *are* in such a simulation are extremely high¹².

Bostrom posits a posthuman civilization¹³ will have access to vast amounts of computing power, and that consciousness is substrate-independent and therefore computable. He notes that running an ancestor-simulation – computing the states of all human minds in history and seamlessly integrating all sensory experiences into a believable whole – would require the use of only an insignificant fraction of the total computing power at this civilization's disposal. As such, just one posthuman civilization can run an astronomical number of ancestor-simulations. The implication is that *at least one* of the following is true: 1) *few* human level civilizations reach a technological singularity, 2) *few* posthuman

11 Drawing on Moore's Law of exponentially increasing computer power, and more generally the accelerating change in the ordered complexity of universal history, several serious futurists and computer scientists postulate the development of computer superintelligence sometime this century. This will initiate a loop of recursively improving machine intelligence and is therefore the last invention humanity need ever make. See Kurzweil (2005), *The Singularity is Near*, or the essays at <http://kurzweilai.net/> for more on the technological singularity.

12 Bostrom, “Are You Living in a Computer Simulation?”, *Philosophical Quarterly* (2003), Vol 53, No.211, pp.243-255. Available online at <http://nickbostrom.com/>.

13 Posthuman is taken to mean any intelligent species that takes off the exponential runway of a technological singularity.

civilizations are interested in running ancestor-simulations and 3) almost all souls are simulated.

If the first proposition is true, that would imply that either we can expect to get stuck at some kind of technological plateau before taking off the exponential runway into recursively improving superintelligence, or technological civilization is going to undergo an apocalyptic collapse. Due to the nature of the Pattern of our Tapestry¹⁴, the first possibility is highly unlikely. In the latter case, accelerating progress will be terminally interrupted under the assault of resource depletion, runaway global warming or lethal black swans like a 100%-mortality human-engineered virus or nanobot pandemic. Although these are serious existential risks, I am not pessimistic enough to ascribe only an infinitesimal chance of making it to the technological singularity¹⁵, so assuming my intuition is correct will disqualify this first proposition.

The second proposition requires a remarkable degree of convergence amongst all posthuman civilizations, such that either almost all of them develop ethical systems that lead to effective bans on ancestor-simulations or that almost all posthuman individuals lose the desire to run them. Although impossible to disprove until we ourselves become posthuman and adopt posthuman ways of thought, I think such a uniform degree of convergence is unlikely in the extreme.

The final remaining possibility is that we live in a simulation and that our perceived reality is not the most fundamental one. Let us not forget that we arrived here by a tentative process of elimination; the most potent confirmation that we live in the Matrix¹⁶ would be if we become posthuman and set up our own ancestor-simulations. It is almost certain that we will never simulate unless we *are being* simulated. This sets up a recursion, in which our simulators, and their simulators, are themselves being simulated *ad infinitum*. However, since computation is existence, the height of the stack would be limited by the exponentially expanding demands on the basement hardware.

All simulated universes are subsets of their simulators, so one can imagine the whole structure as a finite series of vast but finite nested cellular automata, labyrinths within labyrinths, Tapestries interwoven within one Great Tapestry. Thus out of the Void cometh a pantheon of Gods, with one Lord God (called Zeus), playing games with the souls of lesser Gods and mere mortals. Such is the sublime cosmology of the Great Tapestry.

A property of subsets is that they are subject to the same axioms and rules as the sets to which they belong. Therefore the Pattern of any Tapestry, including our own, is equivalent to that of the Great Tapestry itself. This means that at the most basic level the computational processes are equivalent, blurring the line between simulation and reality. Therefore all authentic ancestor-simulations will have the same directive principle in their universal evolution as their simulators (i.e. the same tendency towards growth in ordered complexity culminating in a technological singularity). However, following a technological singularity the space-requirements on the simulator that are needed to continue a believable simulation will start increasing at a blistering rate¹⁷. Since the calculating space of the

14 The next section is largely devoted to this, i.e. the Pattern / computer *procedure*, as opposed to the *environment* here.

15 Many models of technological growth *and* ecological catastrophe have tipping points at around 2050 (Kurzweil places the technological singularity at 2045; James Lovelock predicts climate chaos by the 2040's; most scenarios from *Limits to Growth: The 30-Year Update* end in global human die-off at around mid-century). There exist many caveats, which will be systematically covered in the last section, but for now I will note that it is very difficult to predict which trend will win this 'battle of the exponentials', so I'll go with 50%. Also assuming a 50% chance of civilizational collapse due to a technological disaster like the 'grey goo' scenario and discounting the (tiny) probability of a natural extinction level event like a super-volcano eruption or giant meteor strike, we have a 25% chance of experiencing a posthuman future.

16 Borrowed from *The Matrix* films where machines imprisoned humanity in a simulation. Specifically refers to a simulation, whereas a Tapestry can be either a simulation or base reality.

17 One of the findings of the next section is that the Pattern exhibits doubly exponential growth in ordered complexity

simulator is itself limited, this might (or might not) present several consequences.

Assuming that the calculating space available to the simulator is far bigger than the space they will ever allot to our civilization, we will eventually reach the final limits of ordered complexity without ever figuring out whether or not we live in a simulation. (Nor will it matter). This cannot be the case if the simulator civilization originated from a universe similarly 'fine-tuned' like ours, because then its initial parameters, e.g. total amount of mass and energy, would have been similar to ours, which in turn implies a calculating space that is similar in magnitude to ours (unless they merge with us). However this would not apply to a universe that is endowed with a much greater calculating space and maintains itself at a stable state with a different set of fundamental constants. The question of whether such a universe is computable (and therefore exists) I leave to the theoretical physicists.

The other case alluded to above is where the space allocated to our ancestor-simulation is not predefined by its programmers. In this case there are three possibilities: either our simulation is terminated, constricted, or displaces its simulator¹⁸.

Bostrom notes that whenever the strain on the hardware of the lower levels of the tree becomes too great, the higher Gods cut off the offending branches and terminate excessively space-hogging posthuman civilizations. He hopefully postulates that such philosophical ruminations lead all posthuman civilizations to develop an ethical system of being nice to their ancestor-simulations, because none can logically assume itself to be Zeus; for even Zeus Himself cannot know Himself to be Zeus. The overwhelming likelihood is that one's civilization is a minor deity. The only possible proof of one's position in the chain, divine intervention, indicates a negative outcome. Thus it is possible that all posthuman civilizations refrain from killing their children, in fear of holy punishment from above. Although a logical hope, it is as yet impossible to verify that these such values are typical of those posthuman civilizations; and as with his second main proposition, assumes an intuitively unlikely degree of ethical convergence amongst them.

So it's feasible that someday in our posthuman future, perhaps after saturating a few galaxies with life (either in a few million years if the speed of light remains a limiting factor, much faster if not), we will pass a critical value beyond which the simulator no longer has the calculating pace to continue running our simulation, or the will to expand that space. In the midst of the burgeoning expansion, glitches will appear in the Matrix; the fabric of reality will unravel into oblivion. Alternatively, passing such a critical point could activate another program that will even out and trim excess complexity so that a from now on constricted simulation could continue. This will probably take the form of an

whenever limits to growth are far away, but ceases to be exponential when growth approaches or overshoots the limits. (Thus if after the technological singularity we monitor a log graph of the ordered complexity of our civilization, its dipping below a prior straight line fit may imply that space for further computational expansion is coming to an end.) A reasonable objection is that the calculating space needed to simulate a cellular automaton remains constant, independent of the complexity of its states at any one moment in time. This is true, but neglects the possibility of simulating areas not under observation by deep intelligence, by approximation and compression (i.e. no point to a falling tree in the forest making a noise when there's no-one to hear it). This possibility will vanish as the universe becomes saturated with intelligence at the most basic level, such that now everything will need now need to be computed so as to maintain the belief in reality of the simulation's denizens. While it may be possible to simulate an intelligent planet, there may not be enough space to simulate an intelligent universe.

18 There exist a plethora of other exotic possibilities. There is no reason to discount the possibility that I am in a self-contained 'me-simulation' and that everyone around me are philosophical zombies, acting just realistically enough to lull me into believing in my reality. This is nothing more than a new take on Descartes's 'brain in a vat' thought-experiment. Another possibility Bostrom mentions is that simulations only ever occur for a small period of time, with all memories preset (which, incidentally, take much less computing power to simulate than working, conscious brains). All these lead to philosophical dead ends, as do all solipsist worldviews, and I will consider them no further.

extinction or zombification¹⁹ of surplus souls.

Perhaps the most intriguing possibility is that posthuman civilizations commit suicide by incubating a simulation and gradually feeding in all their calculating space to sustain. Thus, simulation displaces reality (or the other way round), thus recalling the Borgesian fable in which a secret synod of chess masters and prophets of the postmodern testament infiltrate global institutions and substitute conventional reality with a labyrinth of perceptions, simulacra and fantasy²⁰.

After determining the various consequences that may follow from viewing our universe as a simulation within a simulacrum, let us end it with a brief discussion of eschatology²¹. Physicists believe that our universe came into existence via a Big Bang of matter and energy from a single, infinitesimal point and will end in one of two ways. In the case of a 'closed universe' with lots of dark matter, gravitational forces will overwhelm expansion and the universe will collapse back into itself in a fiery maelstrom called the Big Crunch. Alternatively, an 'open universe' could continue expanding outwards forever, in which case the background radiation converges to absolute zero, the stars and galaxies burn out and particles get separated by huge distances, and eons later disintegrate into oblivion.

Looking at this from the simple computational view, the state of the cellular automaton at the time of the Big Bang is perfect order. The immediate next state begins the transition to chaos with loss of entropy in the seething plasma of exotic particles. This mass cools down and forms itself into stars and planets. On some a localized growth in ordered complexity occurs, in contrast to the sea of randomness all around them, and perhaps culminating in the saturation of the whole cellular automaton. With time the delicate balance of order and randomness that is the intelligent universe will struggle to preserve itself against the crushing order of fire or the encroaching chaos of ice. In the former case, the loss in entropy will reverse and the universe will start contracting into the Big Crunch, with computation (and simulation of other worlds) soaring until the omega point is reached, closing the loop of existence. In the latter case, computation will slow down due to the unrelenting loss in entropy but will continue for a much longer time – until the last particles disintegrate, if reversible computing²² is perfected and utilized. Whether the universe dies by ice or fire²³, the end state reverts back to perfect order – and presumably, a new Big Bang and identical iteration, since all cellular automata will loop when they return to a state in which they once existed.

Our future is written in advance. Down one forking path, the ordered complexity of our civilization expands at an exponential pace in the wake of the technological singularity; at a finite moment in Time, glitches multiply and the fabric of reality unravels as our Tapestry is torn asunder. Down another path, exponential growth gives way to asymptotic convergence. Our posthuman civilization is either ruled by God, built on the bones of God or is Zeus Himself; but we will have no way of knowing which of these is true. Everyone will be a God. If we do not peremptorily commit Suicide and instead choose Struggle, we will play games with the souls of those in our simulations until our Tapestry comes to its end, rewinds and starts a new iteration that is identical to what came before. This is one representation of Sublime Oblivion.

19 In the sense that consciences will be nullified so as to relieve the load on the simulator computer, since simulating augmented consciences would be the most resource-demanding task.

20 Borges (1940), *Tlön, Uqbar, Orbis Tertius*.

21 End of the world. Note that we are talking about the (Great) Tapestry of Zeus and authentic ancestor-simulations only.

22 Uses no energy as long as no information is thrown away; but since memory is finite, in time there will be nothing left for this computer to do but replay memories in loops.

23 The scientific view at this time is that expansion is accelerating, the universe is open and will end in ice and oblivion. I think this is the more likely result. To know the point at which entropy must be reversed, you need a certain level of chaos, which is hard to measure. On the other hand, the uniformity of a discrete point or total oblivion is easy to identify.