

Biography



Bruce Damer has been a pioneer of the medium of virtual worlds and avatars over the last dozen years, creating the first conferences, large scale experiments and writing about the medium including *Damer, B. (1997). Avatars: Exploring and Building Virtual Worlds on the Internet, Berkeley: Peachpit Press*. He is currently leading a team to build virtual worlds for the design of NASA missions. In 1996 he founded Biota.org (Barbalet 2007) which hosts the Biota conference series and podcast, now a leading community resource for artificial life developers. In 2008 he initiated the EvoGrid project to create a large scale evolutionary simulator in the Internet. Bruce also serves as curator and historian of one of the world's largest collections of artifacts of personal computers housed in his Digibarn Computer Museum. Here he is shown in real life and as his avatar in Second Life.

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The God Detector A Thought Experiment

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Disclaimer

I am a technologist, and in this piece I shall approach the key questions of this book as a programmer and historian of technology. In my treatment I will not consider influences of the Divine in our lives in terms of matters of the heart, faith, hope, or the rest of the human cultural milieu. I will simply take on the claim made by some that God plays an active ongoing role in the mechanics of the universe and in the evolution of life. To me this seems like a question best approached from an engineer's frame of reference. A good starting point is to consider the lessons learned and the questions raised by those of us engaged in the new field of "artificial life".

The Artificial Life Programmer, the New Alchemist?

Like medieval alchemists before them, programmers developing artificial life software (often shortened to "A-life") are drawn to the elusive yet seductive proposition that they have the power to animate inanimate matter (Farmer & d'a Belin 1991). In this modern reincarnation of alchemy the inanimate medium is a microscopic substrate of billions of transistors. Popular media from science fiction to Hollywood often depicts A-life as computer viruses and self-reproducing robotics running amok. This means that A-life practitioners (in academia or the hobbyist community) attract quite a bit of press, much of it

sensational. As a result, in these reports we are rarely treated to the subtle issues and challenges faced by coders of biologically-inspired virtual worlds.

Another key point is that there is often confusion between the fields of artificial life and artificial intelligence (AI). A-life developers agree that theirs is a “bottom up” approach wherein they simulate a large number of interacting components employing relatively simple rules from which complex behaviors of a whole system emerge (Langton 1991). AI on the other hand tackles the ever receding goal of creating a “conscious” entity with which we would one day be able to communicate. The apocryphal moment of the coming of walking, talking machine intelligence is sometimes referred to by pop-culture practitioners as “the singularity” (Kurzweil 2005). To complicate matters further, developers of A-life software cannot even agree on what defines an “authentic” A-life implementation.

Still, out of all of this confusion emerge some insights we could apply to the Intelligent Design/Creationism vs. Evolution/Science discussion. But before we can draw a hasty conclusion as to whether an artificial life programmer is acting as an “artificial god” (Adams 1998) and “intelligent designer” of his or her own authentic little virtual universe we have to understand the two diametric poles of the A-life continuum.

Two Kinds of God in the A-life Universe

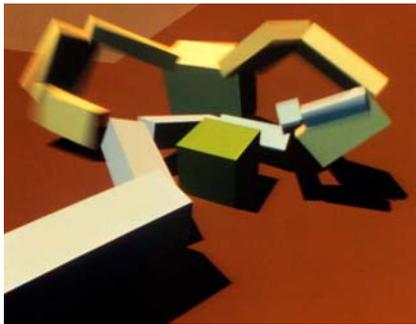


Figure 1: Karl Sims' Evolving Virtual Creatures (1994).



Figure 2: Will Wright's game Spore (2007).

Perhaps the best way to classify A-Life software is to look at two ends of a continuum represented on the one hand by Karl Sims' Evolving Virtual Creatures (Figure 1) and on the other by Will Wright's game Spore (Figure 2). Karl Sims' creatures started life as a simple pair of hinged blocks in a virtual universe that simulated basic physical properties such as fluid, collisions, gravity, and surface friction (Sims 1994). From that point on the simulation was allowed to continue on its own without human intervention. The creatures would perform simple tasks such as swimming or walking, or competing with other creatures for control of a block of "food". The best performers were allowed (by the system software) to reproduce. Random mutations were introduced automatically into the "genome" of the creatures between generations, affecting the external body shapes or internal control functions. In this completely "hands off" A-life system the virtual creatures "evolved" many of the same mobility strategies found in nature (swimming with four paddles like a turtle, slithering like a snake, or perambulating like a gorilla). All of these behaviors emerged without human programmer intervention.

In contrast, the computer game Spore, which is being developed by Will Wright of the Maxis-Electronic Arts company, bears only a passing resemblance to an A-life environment. The release of Spore in 2008, will, however, be heralded as an "evolution" or "biological" game and yet most activities are largely directed by the human player and built-in procedures. Players use editor tools to design creatures, landscapes, dwellings and vehicles, guiding virtual creatures who inhabit toy planets to live out virtual lives from primordial soup to the space age. The populations "evolve" through procedural algorithms until the player (or game code itself) again intervenes to keep the action moving forward.

Given this continuum, we posit that there two kinds of God in the A-life universe: the Karl Sims' *God the Mechanic* building the machine that is the whole simulation, setting its initial conditions and then returning only occasionally to view the current state of the simulation; and Will Wright's *God the Tinkerer*, constantly poking and prodding to tweak the mechanisms of virtual creation. Clearly these definitions might also apply to different extremes of *god traditions* found in human cultures.

There are two key kernels of truth that we can winnow from these early decades of A-life alchemy:

Kernel 1: That all attempts to render life down into its basic elements and then represent it abstractly come down to: a) creating an algorithm for making copies of the blueprints to make yet more algorithms and b) that imperfect copies of these blueprints are sometimes passed on, creating variations and, possibly, advantageous adaptations.

Kernel 2: That after these algorithms run for a while, passing on a great number of blueprints and interacting within some kind of a simulated virtual environment, the whole system reaches a tipping point where, to our perception, it becomes opaque to complete understanding. Thereafter even the A-life developers themselves must assume the role of a biologist, dissecting the genomes of their virtual creatures or examining their “fossil record” looking for clues to what the process of artificial evolution hath wrought.

Lost in the Noise of the Data Explosion

Thus, the observer of the biologically inspired software simulation soon becomes “lost in the noise” (Negroponte 1995), much as a biologist might spend a lifetime to grasp one small aspect of the stupefyingly complex machinery of a single cell.

I propose that this property of *onset opacity* also holds for the world’s religious traditions. For each there was an original prophet, and an original set of core stories and concepts (some new, some drawn from prior traditions). Once the copying of these stories got underway, a mutation and adaptation process began. The resulting data explosion of writings, stories, laws, debates, schools, conflicts, extinct lines, and new branches soon obscured many of the original statements attributed to the founding prophets. Religious seekers (and even many serious researchers) are unable or unwilling to apply reductionist methods to prune out later inserted, contradictory or inconsistent yet closely held beliefs or writings. In addition, modern monotheistic religions stand upon foundations of earlier belief systems, most of which carry no written record. Therefore, fundamental questions about God and the universe that might emerge from any religious tradition are likely to remain lost in the largely opaque “tree of noise” of religious histories and discourse. In other words, if at any time God ever made Himself unequivocally visible to a human being and uttered or physically manifested anything about life or the universe, that original direct experience of

God's existence has become irretrievably lost. In modern times, no verifiable experience of God's presence in the physical universe that is not explainable by other means has been observed. Therefore, if we cannot validate the original claims, or detect any direct physical influence today, we have to look for evidence of God's Hand at another level.

The God Detector

For some of the other authors of this book, prior writings about God, or personal (but unverifiable) experiences of God is evidence enough of His existence. However, when making a strong claim about God the Intelligent Designer, such empirical evidence is not good enough to make the case. If God is a programmer tweaking the code of the physical observable universe (not just affecting our own independent thoughts) his influence has to be detectable and independently verifiable. To sense the hitherto unseen Hand of God, we hypothesize that it might be possible to employ a *God Detector* which could either be *found* or *built*. We will first take on the challenge of identifying an existing natural God Detector and later on in this chapter, consider building a God Detector using human technology. If you will indulge me, dear reader, I invite you to join me in the following thought experiment surrounding the *quest for the God Detector*.

Finding the God Detector

How to look for signs of God's influence comes down to *where* to look for them, and that comes down to *what* you look at and what you *exclude* looking at within the universe.

For a time, I set down my pen and declared to myself that this was an unsolvable problem. A few days later I was reading a history of the Institute for Advanced Study in Princeton in the USA where I am a currently a visitor. A brilliant account of John Von Neumann's digital computer designed and built at IAS in the late 1940s contained an account of an impassioned researcher named N. Boracelli who was developing "numerical symbioorganisms" for this pioneering digital computer (Dyson 1997). I was stunned to realize that on a machine of such tiny capabilities, Boracelli was able to run basic artificial life code thirty five years before the term was coined.

This led me to the following insight: what if the universe could be reduced down at the lowest levels to a programmable machine running algorithms? Several theories of how the universe works at the quantum level propose that this is in fact how things work (Lloyd 2006). I realized that if you can render the universe's operation down to simple algorithms, basic questions could then be asked, and a natural God Detector could be found at a key code location found within one of the universe's algorithms.

God and the Copying Rule

A living organism differs from bare rock, gases or a pool of liquid in one very specific way: the living organism contains instructions that are copied, for the most part unaltered, from one version to the next. In fact the organism *must* copy these instructions or face extinction. Thus, there would be no copying mechanism if previous copying mechanisms ceased to work, so copying mechanisms can and must continue to copy. This is the Copying Rule, and, as we have seen previously, it can also be found at work in human culture, where language permits the telling and retelling of a story, and also within the new medium of digital computers and networks, where programs are copied between computers.

The universe contains a large number of seemingly copied objects, from rocks to stars to galaxies, but the process by which these objects were made did not involve construction from a blueprint, instead their existence is owed to the laws of physics applied to starting conditions. Therefore, as far as we know, all matter and energy in the universe inhabits one of two organizational regimes:

Regime 1 which is governed by...	Regime 2 which is governed by...
<ul style="list-style-type: none"> • Formulaic Laws of Nature • An element of uncertainty, or randomness we might call "R" 	<ul style="list-style-type: none"> • Formulaic Laws of Nature • An element of uncertainty, or randomness we might call "R" • The Copying Rule

As we infer from the above table, along with the Laws of Nature and the Copying Rule, another of the distinct organizing operators of the universe is the element of uncertainty. This could be thought of in terms of unpredictable (i.e. random) effects either from some source in the very small (quantum fluctuations for example) or the very large (the mass overlapping effect of gravitational

forces from atoms, stars and galaxies for example). We will take up this operator “R” later as it is the pivot on which this simple thought experiment turns.

The Copying Rule is well understood in molecular biology. For each genotype (information blueprint encoded in a cell’s nucleus) a phenotype (a living body or other resulting output) is produced. The Copying Rule as seen operating in human culture is less well understood but clearly occurs. Copy-able cultural objects such as ideas, stories, music or instructions are sometimes referred to as “memes” within a new field called “memetics” (Dawkins, 1976). Clearly, technological objects (where copies of objects are made with reference to instructions) also execute the Copying Rule. As we addressed previously, a sub-specialty of computer software called artificial life attempts to emulate the biological implementation of the Copying Rule by creating software analogues to genotypes and phenotypes. More radical thinkers consider all software, such as ordinary applications like word processors, to also execute the Copying Rule with humans acting as the phenotype (the host) that is the mechanism to enable the copying of these programs (Dyson 1997).

A Simple Model of the Copying Rule

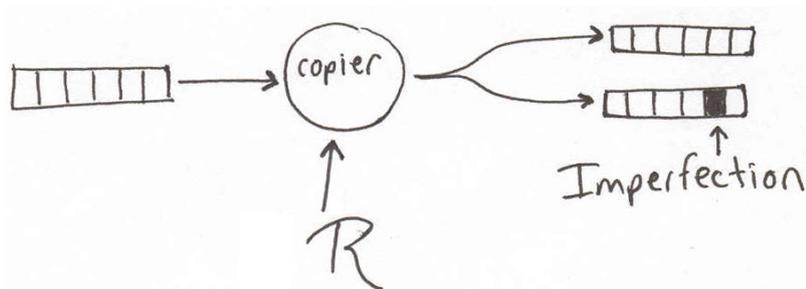


Figure 3: The Copying Rule.

A simple model of the Copying Rule is depicted in Figure 3. An input sequence of information, which could be encoded in molecular material, language or computer code, enters a copying mechanism upon which some random input R may or may not act, and two or more resultant output sequences are produced, some of which may contain random changes. There are variations of this mechanism, one that would take two input sequences and combine them into an output sequence. A Copying Rule could be said to have been “successfully executed” if the output information sequence is not so altered that it could not be

used to produce a future copy. A “failed” application of the rule produces a sequence that can never again be copied.

Scope and Time Scales of the Copying Rule

The Copying Rule is the central driving mechanism within biological evolution, cultural evolution and technological evolution and operates across a range of time scales and scopes: from billions of years to kilo-years for molecular evolution to years or days for cultural evolution, and days to milliseconds for evolution in information systems (see table below).

Molecular copying 4 billion to 1 kilo-years	Cultural copying 1 kilo-year to 1 day	Digital copying 1 day to 1 millisecond
<ul style="list-style-type: none"> • Development of multi-cellular life • Divergence of Galapagos finch populations 	<ul style="list-style-type: none"> • Rise and fall of a great empire (or religion) • Spread of hoax on the Internet 	<ul style="list-style-type: none"> • Spread of virus on the Internet • 1 millisecond of computation in SETI@Home grid

How God the Intelligent Designer Engages the Copying Rule

A “designer” is someone who makes a plan for the future and instructs other people or mechanisms to bring that plan into reality. If God is acting in the universe as an “intelligent designer” and desires to operate in places where there are living things, then He has no choice but to engage the Copying Rule.

God has two obvious ways to interact with Copying Rule:

- 1) God would engage the Natural Laws that make the copying happen or
- 2) God would influence the operation of the Copying Rule by engaging the nondeterministic forces we call R, which create the imperfections or mutations in the copying process.

Common sense dictates that God cannot use both of these mechanisms at the same time as they work in opposition. For example, while the laws of gravity cause a feather to fall predictably, the random motions of the air through which the feather travels produce an unpredictable landing place.

By calling God a “designer” it is implied that He an actor upon the forces that shape the universe and is not those forces themselves. A God who is operating solely through deterministic laws is a God with no free-will. These laws affect the universe in pre-ordained ways with predictable outcomes. After the creation of the universe (and these laws) this *God the Mechanic* would simply leave the universe to run on autopilot and thereafter be undetectable.

If God cannot suspend or change the natural laws, then He might operate by introducing imperfections as a *tinkerer* in the mechanics of the Copying Rule shifting the application of the randomizer R to cause accumulated errors in the copying process that would give rise to our world (Figure 4).

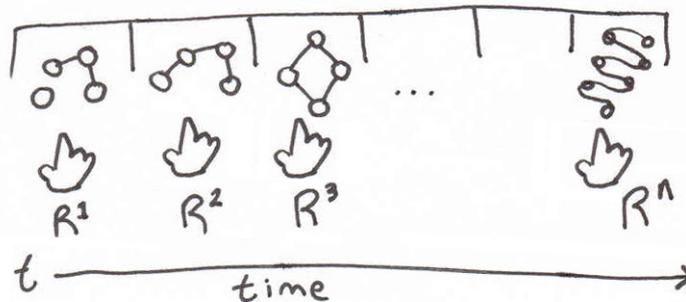


Figure 4: The accumulating effects of R through time.

Perhaps God could decide to permit R to affect the copying mechanism or not, or He could choose to proactively add to or subtract from the influence of R by a large enough amount to “tip the balance” in favor or one copying outcome or the other. In this case the Hand of God should be detectable as localized statistically anomalous behavior in an otherwise uniformly distributed random landscape of R. The monkey wrench in these works is that R itself is by definition unpredictable. If R is governed by some Natural Law or mathematical formula then it would not be R. If God could predict the future value of R and act accordingly then we would have our God the Mechanic back. So God, just like the rest of us, has to live with the unpredictability of R (Figure 5) and would seem to us to operate not by absolute *Will* but by *Whim*. This kind of God would hardly be able to exercise much design upon the universe.

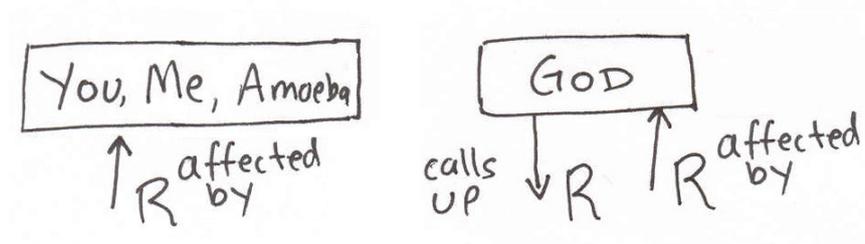


Figure 5: What is affected by R?

The Monk and the Copying Rule

Here is where our thought experiment could use a bit of help from a hypothetical real-world example. Picture a literate monk, working at his table some time in the early years of Christianity. He is given a book written in Hebrew to translate into Greek. In it is a section of a passage:

“...and Jesus was born to the young girl Mary”

Reaching for his Hebrew-to-Greek dictionary scroll and not finding it, he sighs and makes a guess, translating the phrase to:

“...and Jesus was born to the virgin Mary”

Perhaps random fluctuations in air molecules contributed to a puff of air that nudged the dictionary scroll from the table, and hence caused the translation of “young girl” to “virgin”. Many scholars believe that this translation error actually occurred (Brown 1977, Pagels 2003) and led to the concept to the “virgin birth” or “immaculate conception” in the Catholic tradition. The resulting impact of this was substantial for the future of Christianity, leading to its wider adoption throughout the Mediterranean, where there were existing religious movements that also believed in spiritual power emanating from a virgin birth. The virgin birth idea also led to the suppression of women (whom evidence suggests were treated more equally in the early church) by enforcing male celibacy and sequestering devout and intelligent females away in convents. Male domination of the early church was therefore assured, which eased the integration of the religion into Roman power structures. The supernatural aura of

the virgin birth also propelled the character of Jesus along a road that led to his elevation to Godhood following the council of Nicea in the fourth century.

Would God have had a hand in this fateful application of R to the translation of early Christian texts? Certainly if it was God's intention as an Intelligent Designer to promote Christianity as a new religious force (at the cost of existing belief systems) then we might say "yes", God influenced the movement of air molecules, at the quantum level, at that critical juncture.

However, God would have to have done more than just arrange for the translation error. God would also have to ensure that the proof-reading senior monk, upon seeing this one term, would not find it erroneous and send it back for correction. In addition, the natural error correcting mechanisms of the followers of the Hebrew version would have to be overcome. In practice, each small change affected through an influence of R (which is by no way guaranteed to work given the unpredictable nature of R) is followed by a virtually uncountable large number of subsequent required adjustments that require almost total foreknowledge of every action. It seems that God's task in influencing history in this way would require a brain that would be large enough to store all possible outcomes while executing perfect adjustments of random effects to guide each step. The size of the required decision-tree for even relatively small scale design changes might exceed the size of the countable particles in the universe. Amazingly, each Monk's brain contains a number of unique pathways through its neurons that already exceed this number. At the finest level of detail, God's brain would have to account for each of these neural pathways and be able to affect the journey of each electron. We are fast approaching an event horizon of total implausibility.

Cultures all over the world attribute "god-like" powers to those who seem to be able to repeatedly "beat the odds" in dice-tossing, in war, in procreation, or in longevity. However, no documented case of the conquest of tremendous odds has ever been produced. Methuselah' 969 year lifespan, and other miracles live strictly in the domain of mythology. It would seem that God is as powerless to affect next toss of the dice as the rest of us.

Many believers might state here that God is a separate, all-knowing, omnipotent actor for whom the universe is a mere toy. In this case then He could choose to be detected or not and we would be powerless to make inquiries about His existence or nature (in which case there is no reason for this book to exist). So

let us return to reason and consider God as an actor within the universe subject in some way to its laws, rather than an incalculably large and immeasurable actor separate from everything.

God the Intelligent Adapter

But wait, there is another way to affect the application of R in the Copying Rule, and that is *through adaptation, after the copying is completed*. Every single celled organism in Earth's early seas that suffered an injustice due to physical or chemical fluctuations, heat, cold or an attack had a chance to adapt to the situation and survive to reproduce another day. The machinery of adaptation adjusts for the ravages of R and therefore diminishes and redirects its impact into the future.

So could God in fact be living at "the output end" of the Copying Rule, in the land of adaptation? If so, God's Hand would be busy helping adapt everything from cellular machinery on up to guiding the entire biosphere through the slings and arrows of large scale misfortunes such as meteor impacts.

In human culture, intelligence emerged as a critical adaptation. Might intelligence therefore be a place where the mark of God is the strongest? Would God then not be an Intelligent Designer but instead be a Designer of Intelligence? Would any act of intelligence be an act of God, regardless of the outcome? If God is trying to effect some kind of perfect design upon the universe then influencing outcomes of adaptation might be just as numerically challenging as trying to control individual applications of R. Just as in our monk's brain example, God is again relegated to being an imperfect player, making do with a limited ability to influence adaptations to direct the future of life.

God, Life, the Universe and Everything

So we return to our original question: if God is an actor in the universe and we render the universe down to its simplest organizing principles, then God must have some kind of fundamental relationship with the Copying Rule. We have decided that, for our purposes, we are not considering a God the Mechanic, who simply sets up the initial Laws of Nature and then departs the scene. If our God

is actively tinkering then He could only affect the progress of life and culture in two ways: by affecting the unpredictable R value that randomly affects copying machinery, or by working His miracles on the output side of the Copying Rule that adjusts for the influences of R through adaptation.

We concluded that God could not affect any kind of predictive design on the universe by trying to influence the unpredictable effects of R as copying occurs. God's information processing capability would probably have to be many times the size of the universe for even minor adjustments to the future and therefore He could not be an actor in the universe.

This left God only one place to act, as a player in assisting the power of adaptation at the output end of the Copying Rule. Thus, God would not be an Intelligent Designer but instead could be thought of as an *Intelligent Adapter*. If God is indeed operating at the adaptation end of the spectrum, then there is no difference between God's work and the work of evolution through Natural Selection or engineering through human intelligence.

For example, a human technologist using his or her own intelligent genetic engineering skills or the processes of Natural Selection over eons could both create a fish that can live in near-boiling water. To those who did not witness the processes of the engineer or Natural Selection, this fish would be indistinguishable from a miracle from God. Would then believers be forced to conclude that Natural Selection or human genetic engineering must be equivalent to the Hand of God or that God's Hand need not be present at all?

In conclusion, given all the above uncertainties the Copying Rule, when pressed into service as a natural God Detector, is unable to permit us to unambiguously detect any unique sign of the Hand of God.

Where does this leave the believer and the non-believer? Those who still wish to include the presence of a *God the Tinkerer* in the universe could still invoke a vision of God the *Intelligent Adapter*, playing an ongoing (but by no means exclusive or unique) hand in the survival and glorious diversification of life as well as the blossoming richness of human culture and technology. Those who find no need to place an actor like God in the picture can celebrate and seek to better understand the process of billions of years of evolution by cumulative copying and adaptation, made even more astonishing by the very fact that *no hand guided it*. Stuart Kaufmann may show us another way, in which he

redefines God "...to mean the vast ceaseless creativity of the... universe" (Kaufmann 2008). If God is embodied in the artful adaptation on the output end of the Copying Rule then He is the agency of the seemingly miraculous processes of Natural Selection and Emergent phenomena.

Afterthought Experiment: Building a God Detector

What if our cumulative technology including computers, networks, robotics, sensors, and Cyberspace, is creating a set of tools which we can use to determine, once and for all, whether God exists? And if so, might we also be able to use these tools to determine God's nature and the exact means by which He manifests in the world? If we as a species could answer the question of the presence of deity in the world it would save untold future strife and focus our intellectual and artistic pursuits like never before.

What if we could "set a trap for God", a place where God could not resist manifesting His Will? What I am proposing is to engage all of the best programmers, artists and philosophers of our generation to create a gigantic network of software and computers, working to create a sort of "Evolution Grid" or "EvoGrid" (Damer 2008). This EvoGrid would start out as *God the Mechanic* (like Karl Sims' creatures) in which we build the simulation, set the initial conditions and then let the artificial ecosystem go from there.

Indeed, such a simulation might satisfy Richard Gordon's challenge in the chapter *Hoyle's Tornado Origin of Artificial Life, A Computer Programming Challenge* found in this volume. The EvoGrid would therefore seek to show that in amongst the vast machinery of the natural laws, and despite the chaos of R, the universe (or God acting within the universe) possesses the innate property to instantiate the Copying Rule and generate us.

However, the EvoGrid, could be set up to also embody some of Will Wright's *God the Tinkerer*, with people in the loop. The way this might work is that the creatures of this simulated ecosystem would systematically consume all of human language and culture available to them in the semantic flow of the Internet. Every piece of text, image, music or video, blog, or other cultural artifact would be both the landscape and foodstuffs for the EvoGrid. The creatures of the EvoGrid would continuously adapt to the myriad streams traveling along the growing cyberspace synapses of the collective human mind.

The EvoGrid would communicate in its own language which we might be able to understand. If there was ever any medium through which God could speak to us, this would be it. Gerald de Jong claims that artificial life and the EvoGrid might be our way to finely polish a mirror we could then hold up to ourselves (de Jong, 2008). Would we then see the face of God?

Giving Birth to God

In our age old quest to detect and define God, there might be another ultimate outcome in store for us. Over the coming eons, would our own divine creations, such as the EvoGrid, allow us to merge with all living things, and transform and connect all of technological and biological reality? Would we then survive long enough to contact and combine with the EvoGrids of other sentient civilizations? If we never detected God in our own EvoGrid it would no longer matter because in some far distant time all sentient minds, biological bodies, and technological creations would ultimately merge into one total universal life form. If the universe succeeds to birth itself as one conscious entity, everything, including us and all of our past selves, will unify into a single being which we will then call... *God the Universe*.

So perhaps God is nothing more and nothing less than an expression of our hopes and dreams for that distant possibility.

“God who created all things in the beginning is himself created by all things in the end” (Stapledon 1937).

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Dialogue

Tom Barbalet

Re: Two Kinds of God in the A-life Universe

As is frequently discussed through our recorded conversations[1], I think the one dimensional continuum between Karl Sims' and Will Wright's creations is problematic.

In an applied critique, Will Wright's Spore is not an artificial life simulation. It is a series of procedural games with a shared theme. Whilst it was originally marketed as a surreal biological evolution game, Spore's marketing has changed focus. From your [Bruce Damer's] and Rudy Rucker's recorded prompting of Will Wright[2], Wright failed to use the term artificial life and in fact showed little interest in contemporary artificial life in his analysis.

Let's take an idealistic view of Karl Sims' work and Will Wright's game. Karl Sims' work is still based in a created environment that he set up to demonstrate a series of ideas. In contrast Will Wright's game allows tens if not hundreds of thousands of users to design creatures to interact. There is one intelligent designer in Karl Sims' environment and sufficiently many in Will Wright's game to be considered noise rather than intelligence.

In addition to the problems of the idealistic view's deconstruction there are many examples which fall outside this one dimensional "A-Life Universe".

Even if the designer is intelligent, the designer does not have to manufacture intelligent creations. In this regard Karl Sims is more sympathetic than Will Wright. The early Grey Thumb experiments[3] offered some interesting results too. Here a small collective of hobbyists spent a Saturday or two trying to produce a more refined version of Tom Ray's Tierra[4]. My understanding is that these experiments either led to the creation of, or heavily utilized, Adam Ierymenko's Nanopond[5].

This idea of the most potent artificial life soup, where digital micro-organisms can develop, seems to be a much lower level attempt to model artificial life than

the engineered example of Karl Sims or the multi-million dollar Will Wright creation.

Re: The Copying Rule and Memetics

Through the discussion and the table, I'm not clear if rocks are inherited from a single Platonic rock or whether rocks exist through a geological naming convention, independent of the Copying Rule. Underneath the Copying Rule there can be many different kinds of chemistry and as attributed to human culture I would assume psychology.

In terms of the "new field called memetics", memetics is as old as I am. In fact, truth be told, memetics is slightly older than I am. I digress.

As genetics is an established field, memetics is not. There are a number of problems using memetics as cultural genetics. I'd like to offer a few of them here.

Genetics as science offers predictable and usable metrics. Memetics offers no predictive analysis. If memetics were cultural genetics, it should be extraordinarily useful to predict cultural trends. Yet it seems to be used to explain things after the fact, not into the future.

Death of an individual is central to genetics. The fact that there are life cycles is critical to genetics. There is nothing analogous to the death of an individual in memetics.

The definition of a meme as a cultural gene means that it should be part of a cultural idea, not all of a cultural idea. In fact what is commonly referred to as a meme should be a number of memes. There is nothing analogous to a cultural atom or gene through memetic analysis.

Re: The Monk

The Monk is about entropy (human inertia) which offers an improvement to memetics.

The Monk exists today in the archetype of the popular historian discarding unimportant facts, the journalist leaving information they don't understand from

a story and fundamentally the retelling of a story with particular emphasis to the point of falsifying the story.

The “virgin” error was a remarkable marketing tool that the editorial monks could have encouraged rather than missed reviewing. In one part, entropy (human inertia) forces a reduction and, in another part, the need to produce more excitement in the reduction. This isn’t genetics, this is entropic physics. You can derive genetics from entropic physics. I would put to you that entropic physics are more primary than genetics and can be used to construct a truer cultural genetics.

References

- [1] Barbalet, T. et al. (2006-2008), Interviews and Conversations from Biota.org, <http://www.biota.org/podcast/>, Specifically: “Can Artificial Life Explain the Cambrian Explosion?” with Roy Plotnick.
- [2] http://www.biota.org/podcast/biota_wright_rucker.mp3
- [3] <http://www.greythumb.org/blog/index.php/?archives/9-Getting-started-in-computer-based-artificial-life.html>
- [4] <http://www.his.atr.jp/~ray/tierra/>
- [5] <http://www.greythumb.org/wiki/Nanopond>