

Divine Sexuality

Eric Steinhart

www.ericsteinhart.com

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ABSTRACT: A crane is a process in which simpler things evolve into more complex things. All cranes depend on some ultimate crane composed of evolving titans. Titans resemble organisms. They evolve into divine male-female reproductive dyads, which design and create ever more complex universes. As universes gain complexity, they contain inner cranes nested in things in outer cranes. They contain exaltations nested in exaltations. Inner cranes recapitulate the histories of their outer cranes. As cranes become nested, human reproductive dyads will become exalted into superhuman networks designing and creating their own software universes.

1. Cosmological Cranes

According to evolutionary writers like Dawkins and Dennett, all complex things are produced by cranes.¹ They are created in sequences which start out simple and which gradually accumulate complexity.² Our universe contains many complex things; it contains biological and technological cranes. If there are any complex things at all, there are cranes; but reality cannot be an infinite regress of cranes; hence there exists some ultimate crane in which all complex things evolve from simpler things.³

The ultimate crane starts with a simple initial thing. And this simple initial thing is basic; it does not depend on some deeper thing. It is the start of the ultimate crane which produces all complex things. Dawkins himself says that “The first cause that we seek must have been the simple basis for a self-bootstrapping crane which eventually raised the world as we know it into its present complex existence”.⁴ All complex things trace their history back to this ultimate simple original thing.

Since there exists an ultimate crane, there are some ultimate things. Some people may want to refer to them as gods. However, to avoid unintended connotations, they will be referred to here as *titans*. A variety of arguments suggest that the ultimate titanic crane is defined by at least an initial and a successor law.⁵ The initial law states that there exists a simple initial titan. The successor law states that every titan is surpassed by at least one more complex titan. So there is an endlessly branching tree of titans. The titans at higher ranks in this tree are more complex. Since there is an initial titan, there is no eternal regression of titans; however, there is *eternal progression*.

2. Titans Resemble Organisms

All titans owe their existence to the initial titan. A cosmological argument can be run to justify the thesis that the initial titan exists necessarily; it is utterly independent.⁶ But

the other titans are dependent; every successor titan depends on its predecessor. Since titans are basic, there are no deeper powers which can produce them. Only titans can produce titans. So the later titans are produced by earlier titans.

Since titans produce titans, they resemble organisms. Titans beget titans. Since it is as simple as possible, the initial titan has no power beyond that of self-reproduction. It is the ultimate self-replicator. The initial titan begets its offspring; but these beget their offspring; and so it goes. Primitive titans are like primitive cells. They must contain self-descriptions in order to reproduce. They contain genomes composed of genes. These genes regulate their growth and reproduction. And these genes are copied from each titan into its offspring. As they are copied, they mutate.

Selective pressures operating within titanic reproduction ensure that mutations get passed on when and only when they increase the complexity of the titans. Every lineage of titans climbs Mount Improbable. As genes are copied from titan to titan, they have a kind of immortality. The immortality of titanic genes resembles that of our own genes. Your insulin gene dies when your body dies; but the information in that gene survives in its copies in your children. The gene is not identical to its offspring copies; but the gene is reborn or resurrected in those copies. And copies mutate. Across the generations, they gain complexity. The titanic genes become upgraded.

3. Asexual Titanic Reproduction

Since titans are the most basic things, they do not interact in any deeper context. They do not mate with each other. Titans beget their offspring asexually. The primitive titans are like primitive cells. They contain genetic self-descriptions; their genomes contain programs which define their reproductive procedures. They reproduce by something like *fission*. Each titan copies its code into its offspring. Every offspring titan includes all the functional complexity of its parent. So every titan is reborn in its offspring. Eternal progression is eternal rebirth or resurrection. But offspring titans are more complex than their parents. Thus eternal progression is also *exaltation*.

As titans grow more complex, their genomes encode more than their own reproductive procedures. They are no longer merely reproductive machines. They contain genes for surrounding themselves with additional structures. Many single-celled organisms build little houses for themselves out of grains of sand or proteins they secrete. These external structures are their universes. Titans live inside of their universes.

A primitive titan is like a *testate amoeba*. The amoeba builds a house around itself out of grains of sand. At the appropriate time, it starts to undergo fission. The amoeba divides into two offspring inside its house. Its genome copies itself into each offspring. The offspring then divide the house. They use its parts, plus newly gathered parts, to build their own houses. They go their separate ways, and the cycle repeats.

4. The Evolution of Titanic Sexuality

As evolutionary biology demonstrates, sexual reproduction has greater capacity to explore the space of biological possibilities. Asexual organisms on earth evolved into

sexual organisms. Although titans do not mate or breed with each other, that does not prevent them from running internal sexual reproduction algorithms. As titans become more complex, they become *hermaphroditic*. They contain parts which are analogous to male and female reproductive organs. They self-fertilize. They reproduce by something like budding. Or they reproduce by parthenogenesis.

Here is an image from Hume.⁷ A hermaphroditic titan is like a parthenogenetic spider.⁸ It weaves its web, which is its universe. It then fertilizes itself, and it lays its eggs. Each egg hatches into a baby spider. These spiders crawl away from their parental web. They start to spin their own webs. These offspring are also parthenogenetic. Each offspring fertilizes itself and lays its own eggs. So the cycle repeats.

The hermaphroditic titans steadily grow in complexity. As they grow in complexity, their reproductive organs eventually evolve into distinct functional systems; they become analogous to separate male and female bodies. Thus titans on every lineage eventually evolve into mated dyads which resemble a male and female couple. As these sexual titans grow in complexity, their mated dyads also grow in complexity. Each dyad produces many upgraded versions of itself. Each upgraded dyad contains an upgraded male and an upgraded female. The parent male is reborn in the upgraded male; the parent female is reborn in the upgraded female. So each dyad produces a plurality of mated dyads, each of which enters into an offspring universe.

Here is another image inspired by Hume.⁹ An early sexual titan is like a pair of phoenix birds. These birds occupy their own nest. They mate with each other. As they mate, they burst into flames. Their ashes contain several eggs. Each egg hatches into a mated pair of chicks. It hatches into two offspring titans. Each pair of chicks uses the sticks from the old nest to build their own new nests. But these titanic chicks have creative powers. They can produce their own sticks. So they assemble their own nests. They go their separate ways. Each pair of chicks matures into a pair of adult phoenixes in its own nest. At the appropriate time, they mate, and the cycle repeats.

5. The Evolution of Titanic Intelligence

As these dyads grow in complexity, they grow in power. But computational theories of complexity entail that they also grow in intelligence. If complexity is intrinsic value, then they also grow in benevolence. It is thus arguable that they become more and more divine. Hume says that the necessity of sexual reproduction applies even to the deities.¹⁰ Advanced sexual titans are couples containing a divine male and divine female, a god and a goddess, a *heavenly father and heavenly mother*.¹¹

Since these mated pairs are intelligent, they begin to use their minds to produce their offspring and to generate their universes. Designers, contrary to Dawkins, do not come from more complex designers. All designers are products of cumulative evolution. They are produced by cranes. On earth, we see many sexual animals evolve into designers. Caddis flies design their houses; spiders design their webs; birds design nests; termites design mounds; beavers design dams and lodges; and humans design vast technological systems. They design their universes like a human male and female couple design their houses. They build their universes out of their own resources.

The titans begin to intelligently design both their offspring and their universes. But intelligent design is not the opposite of evolution. On the contrary, it is merely a kind of goal-directed evolution, which proceeds, like all evolution, through blind variation and selective retention.¹² The only difference is that intelligence is an optimization algorithm. An intelligent evolutionary process can drastically reduce its search space by working with representations of the abstract structure of that space. To take yet another idea from Hume, the titans grow ever more skilled in the arts of worldmaking.¹³ Of course, this does not entail that titans intervene in any universe. Titans generate their universes through the general providence of natural laws. They work no miracles.

6. Titanic Computers Run Software Universes

On the biological analogy, titans build universes like animals build their houses. They are like amoebas building their shells, spiders building their webs, birds building their nests, or humans building their houses. But this biological analogy is too specific and concrete. It needs to be stated in more general mathematical terms. One way to do this is based on the observation that organisms are digital machines. So biological analogies are replaced with computational analogies. Titans are computers.

Since the titans are computers, they do not build their universes outside of themselves like spiders build webs or termites build mounds. They create their universes inside of their own computational processes. The titans are hardware substrates. They are computers running programs. When they run their cosmic programs, their universes spring into existence. Universes are composed of software objects, like gliders in the game of life. A titanic program for a universe is composed of many subprograms. These subprograms are like the genes in an organism. When any titanic gene is activated, a physical thing comes into existence in the universe running on the titan.

As the titans grow more intelligent, they use their intellects to design their universes. As they become mating pairs, the male and female parts of those pairs use their minds to work together to design and build their offspring universes. Each divine male and divine female work together like a pair of programmers. But these programmers are rewriting their own code. They are upgrading their own software. They are engaged in *recursive self-improvement*.¹⁴ Their cooperative activity is their love. It is arguable that our universe is so complex that it was designed by a titan composed of a divine male and divine female. It was made by a heavenly father and mother.

7. Cranes within Cranes

As the divine couples become more complex, their universes do too. Their universes begin to run richer internal computations. They run physical cranes, in which physical complexity evolves. On the one hand, the deepest mathematical laws of evolution ensure that these internal cranes necessarily mirror the titanic cranes. All these cranes are climbing Mount Improbable. So the cranes inside software universes recapitulate some early part of the titanic process. On the other hand, since evolution requires variation, these internal simulations do not exactly reflect titanic evolution.

It was once thought that *ontogeny recapitulates phylogeny*. This meant that the development of an embryo of some species went through the entire evolutionary history which led to the species. For instance, the development of a human embryo retraced the evolution of the human species. The human embryo started as a single cell; it went through a worm-like stage, a fish-like stage, a reptilian stage, a primitive mammalian stage, and so on. It retraced its own evolutionary history. While this doctrine is mainly false in embryology, it approximately describes the way that interior cranes are nested inside of the things produced by exterior cranes.

On this view, physical evolution in our universe recapitulates at least some of the early stages of the titanic evolution which produced our universe. The big bang resembles the simple first titan. After the big bang, matter evolves in our universe into solar systems. Life emerges on planets. The first self-replicator on earth resembles the first simple universe. Life evolves in a great phylogenetic tree which resembles the phylogenetic tree of titans. Earthly organisms resemble titans. Hermaphroditic organisms evolve; sexually reproducing dyads evolve. Organisms which design artifacts evolve. Eventually humans evolve. Humans are biochemical computers.

The evolution of complexity entails that computations become more complex by containing internally fractally nested computations. They become more complex through recursive self-improvement. As our computer grow more complex, they become more intelligent. And they become more cosmological. We make computers in which we run simulated universes. Software ontogeny recapitulates hardware phylogeny: some of the simulations running in computers in our universe partly retrace the history of the universe which gave rise to those very simulations.¹⁵ We simulate the titans; creatures in our software worlds in turn simulate us. Evolution produces simulations nested in simulations. All these mirror each other in infinitely varied ways.

8. Transhumanism

Many transhumanists and related futurists argue that advancing technology will enable human animals to transcend biology.¹⁶ You will become superhuman. Your body will be steadily replaced with artificial parts until you become an entirely synthetic animal. You will become a robot with a human past. As your old parts are replaced with more powerful new parts, you will be steadily upgraded. Your robotic body will become a computer as big as a planet; it will grow into a computer as big as a solar-system; it will grow into a computer with the immense power of a neutron star.¹⁷

As our computational bodies grow in glory, our minds will be exalted too.¹⁸ According to the mathematical principle behind the evolution of complexity, software ontogeny recapitulates hardware phylogeny. Our minds will gain their exaltations by running simulations of their own histories. We will design and create vast software universes. They will resemble our own past history (and thus the past history of our titans). But we will continue their evolutions into new futures. Through new extensions of old routes, our mental processes will climb ever higher up Mount Improbable.

We will simulate the titanic process which gave birth to our universe; we will recapitulate the evolution of earthly life; we will recapitulate the evolution of civilization; we will run ancestor simulations. And we will run these in many different ways. Our

exalted mental processes will contain vast phylogenetic trees of evolving computations. We will contain exaltations within exaltations. We will give birth to minds within our minds. And those internal minds in turn will develop their own computers, and run their own simulations. So simulations will become ever more deeply nested.

But evidence suggests this is all naïve fantasy. Our present ecological and political crises make this great future look unlikely. We are destroying our environment and murdering each other. Our sun will shortly incinerate our earth. And if this great future were likely for us, then it probably would have already happened all around us on other planets. We'd probably be in contact with many advanced alien civilizations. But the skies are silent. It looks like our universe is not friendly to the transhumanist vision.

9. Eternal Progression in the Multiverse

The nastiness of our universe is no cause for despair. Our universe will be upgraded in all possible ways in its offspring. And the genetic components of our universe will be copied into those offspring. The genes of any universe are programs for running the physical things in that universe. Your body is running a program. Aristotle would say that your body-program is your soul. Your soul is a program running on the titanic computer that generates our universe. When that computer runs your soul, your body comes into existence. The execution of your body-program generates your life.

Your soul is just a gene in the cosmic genome. After our universe dies, its genome will be copied into the genomes of its offspring. And so your soul will be copied. You will be reborn in the offspring of our universe. Your present life will be reborn in a plurality of future lives, in future ecosystems, in future universes. But your future lives will not be identical to your present life. They won't be exact copies. Since evolution entails increasing complexity, they will be upgraded versions of your life. Your future lives will make greater progress to higher levels of personal excellence. Your own series of lives mirrors the series of titans. You will become more and more like them.

Your future lives will inhabit universes which are more congenial to the further evolution of life. Those future universes will contain evolutionary processes which run much farther and higher than the evolutionary processes in our universe. The transhumanist and singularitarian visions of the future describe those future universes. Within these advanced future universes, our future selves will transcend the constraints of human biology. Our bodies will morph into vast hardware networks; we will become planetary computers; we will become heavenly computer networks enveloping stars. We will become spiritual machines progressing through all possible degrees of glory. As Hagen puts it, this is eternal progression across a series of universes.¹⁹

11. Celestial Marriage

Our future minds, now realized by networks of celestial computers, will be as intelligent and powerful as the brains of the early titans. Our future selves will be divine; but we will be divinities running inside of the titanic divinities; we will be software deities running inside of hardware deities.²⁰ Our minds will be computers able to run

internal universe simulations. We will become the designers and creators of our own universes. The process of cosmological evolution will run inside of itself.

The evolution of computational complexity always implies fractal self-reflection, recursive self-improvement, functions nested in functions, programs nested in programs. It upgrades itself as it repeats itself within itself. At first we may design and create our own universes as solitary deities. But complexity entails sexuality. A lone god or goddess can't get very far. But a pair of minds, harmonized in love, exploring design space together, can climb much higher on Mount Improbable. Our marriages here may thus be the intimations of greater future marriages. Married couples may therefore be reborn together as increasingly divine dyads. These couples, now running together as networks as large as solar systems, will design and create their universes much as earthly human couples design and create their families and their households.

Although this transhumanist vision of exaltation seems to confirm much of our present human biology, and its reproductive norms, it may have surprising consequences. If we transcend human biology, we will also transcend many of the constraints of human sexuality. If transhumans no longer compete for scarce resources (including reproductive partners), then human jealousy may be replaced with transhuman compersion. Celestial marriage might be replaced with celestial polyamory. An enormous array of new genders and genetic strategies may appear. Perhaps our transhuman families will be more like celestial communes than modern nuclear families. Transhuman reproductive units may come to resemble the superorganisms of the eusocial insects.

12. Conclusion

Nature is a vast evolutionary enterprise. As we climb Mount Improbable, we do it both individually and in groups. We become supercomputers nested inside of supercomputers. We become networks embedded in networks. We will recapitulate our own ancestral histories and elaborate them into new futures. We will contain software versions of evolution nested ever more deeply within themselves. Social networks of divine minds will design and create universes. And as these universes make progress, they in turn will contain gods and goddesses which cooperatively run universes. But this eternal progression runs into the transfinite. It has no end at all.

Notes

¹See Dawkins (1986, 1995, 1996, 2008) and Dennett (1995).

²Evolution accumulates complexity according to Dennett's *Principle of Accumulation of Design*. That principle states that "since each new designed thing that appears must have a large design investment in its etiology somewhere, the cheapest hypothesis will always be that the design is largely copied from earlier designs, which are copied from earlier designs, and so forth" (1995: 72).

³If there is an infinite regression of cranes (that is, cranes infinitely nested in cranes), then that infinite regression is infinitely complex. But now that infinite complexity requires some explanation, which cannot be part of that infinite regression of cranes. One way to explain it says that an infinite regression of cranes is the limit of an infinite progression of cranes. Any infinite regression of cranes depends on that infinite progression just as the integers depend on the infinite progression of natural numbers.

⁴For the self-bootstrapping first cause, see Dawkins (2008: 184-5).

⁵For the initial and successor laws, see Steinhart (2012, 2013, 2014).

⁶The necessary existence of the initial titan is justified by a modal cosmological argument. See Leibniz (1697).

⁷For universes woven by spiders, see Hume (1779: 90).

⁸Parthenogenetic spiders exist (Edwards et al., 2003).

⁹For universes built by birds, see Hume (1779: 87).

¹⁰For sexually reproducing deities, see Hume (1779: 78).

¹¹The Mormon doctrine of the heavenly mother is discussed in Jorgensen (2001) and Paulsen & Pulido (2011). The theory of the divine dyads discussed here has both similarities and dissimilarities with the Mormon doctrine of heavenly parents.

¹²Design is goal-directed evolution, proceeding through blind variation and selective retention. See Dennett (2004) and Simonton (2010).

¹³Hume portrayed the gods as engineers; as their crafts are passed down from parents to children, they grow ever more skilled in the art of worldmaking (1779: 77).

¹⁴For recursive self-improvement, see Good (1965); Kurzweil (2005: 27-8); Schmidhuber (2007); Chalmers (2010: 11-22).

¹⁵The Millenium Simulation recapitulates the history of our universe in a computer in our universe (Springel, 2005). So does the Illustris Simulation (Genel et al., 2014).

¹⁶Moravec (1988, 2000) and Kurzweil (2005) describe transhuman evolution.

¹⁷Sandberg (1999) describes these enormous computers.

¹⁸Cannon (2015) discusses the links between Mormonism and transhumanism.

¹⁹Hagen (2006) describes Mormon eternal progression across universes.

²⁰See the "New God Argument" in Cannon (2015: 212-13).

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