**Experimental Evidence for the Meaning of Saturn who Devoured his Children**

 **Maxson J. McDowell, Joenine E. Roberts and Alexandra Roth**

For a complete transcript of class, see Appendix below

For an audio-record of class see <https://youtu.be/TKT7-bsont0>

Copyright 2024

**=**

**Abstract**

(74 words)

This paper integrates symbolic thought and experimental research. We hypothesized that symbolic narratives provide homeostasis for the complex adaptive systemthat is personality. Our interpretation of a dream was based, in part, on this hypothesis. We found that the dream retold the myth of Saturn. When, by direct experiment, we tried to falsify our interpretation, our results supported our interpretation and thereby supported our hypothesis. Previously, evidence for this hypothesis had been only anecdotal.

**Introduction**

When Shakespeare (1609) compared the arc of a person’s life to the sun’s daily passage (‘having climbed the steep-up heavenly hill’) he evoked *symbolic meaning*: each of us is like the sun that is born in the morning and dies in the evening. A person is not literally a star and sunrise is not the birth of the sun but, symbolically, the comparison captures some of the grandeur of a human life, which mere logic could not. Here we use ‘symbol’ to mean what Jung called a ‘true symbol,’ the best possible representation of a mystery. More commonly ‘symbol’ is used to mean ‘sign,’ like the plus sign that represents something fully defined. Symbolic meaning (in our sense) and experimental science seem incompatible — a scientist may not see the value of symbolic meaning while a symbolist may not see the value of experimental evidence — but here we show that these different modes of thought can support each other. This paper is interdisciplinary. As we proceed, you should expect some rapid changing of the horses.

Because the image of Saturn eating his children is grotesque we repress it, shut it away in a blind corner of our mind. Does it symbolize a *father* *complex* (an internalized tangle of emotions, attitudes and thoughts linked to the father) that, while we hide it from ourselves, may act autonomously, out of fear or envy or greed, to devour new potential? There are many facts consistent with this interpretation. Teachers may bully their students until they lose confidence, doctors and therapists may undermine their patients to exploit them, men mansplain women and, all too often, children are physically or sexually abused. But these facts are only *circumstantial* evidence. As such they cannot falsify or confirm the father-complex interpretation of the myth of Saturn.

A psychoanalyst may provide clinical evidence for the father-complex interpretation but this is only *anecdotal* evidence that likewise cannot falsify or confirm the interpretation: ‘Of course a psychoanalyst sees a complex. That’s what a psychoanalyst expects to see.’ Another therapist might explain the same patient’s problem differently: the patient has a mood disorder due to a chemical imbalance that can be managed with a combination of several psychotropic drugs, or the patient has a behavioral problem that can be treated with cognitive behavioral therapy. How are we to choose between these explanations?

A more popular interpretation, repeated by Cicero and Plutarch, bowdlerizes Saturn, perhaps in deference to the sensitivity of patriarchs. Two unrelated names, *Cronos* (the Greek god identified with Saturn) and *Chronos* (the god of measured time) are conflated: Saturn thus represents no more than father time, the grim reaper, or perhaps he represents the normal conflict between youth and old age (Panofsky 1939/1967). Joseph Campbell (1949/1973, p. 91) said that Saturn represents the belly of the whale. Or perhaps Saturn’s devouring represents only the wrath of God. Because many interpretations are possible, can we only *guess* at the meaning? Freud saw evidence in myth and dream for his psychosexual theory while Jung said that each god represents an archetype. Campbell claimed that all myth belongs to a ‘monomyth’ of the hero’s journey and Levi Strauss found evidence in myth for his structural theories. Is a myth or dream only a fantasy that, like a Rorschach inkblot, serves as a screen onto which we project our own issues?

One of the authors (mjm) has a background in molecular biology, a field that benefited greatly from simple experimental systems. Here we describe a simple experimental system that generates *experimental* evidence that a myth (or dream) is not merely a fantasy but rather a symbolic statement whose meaning can be interpreted with some precision. For experimental evidence, an hypothesis leads to predictions that can then be falsified or confirmed by new data. Our hypothesis is that *the function of* *dreams and myths is to provide homeostasis for the self-organization of the complex adaptive system that is personality.*

How did we arrive at this hypothesis? Maynard Smith and Szathmary (1999 pp 8, 169) argued that human complexity is specified by information stored in two forms, (a) the DNA sequence of genes and (b) verbal language, each of these forms having almost unlimited storage capacity. Evidence from molecular biology shows, however, that while genes help to guide human development, genes specify little structure (see below). Biological complexity is now explained by the theory of complex dynamic systems and complex adaptive systems[[1]](#endnote-1) as developed by John Holland (1992; 1998 pp. 1-14, 115-18, 121-24, 141-142, 188-190, 202-220, 225-27) and others. Since Holland’s groundbreaking discoveries, biologists have researched complexity theory in granular detail (Ma’ayan 2017; Mazzocchi 2008). Here we use complexity theory to show that personality development requires myth.

First we must explain dynamic systems, self-organization, and complexity. In brief, a dynamic system is one that *only exists while energy flows through it*. A fire, for example, is a simple dynamic system that only exists while its fuel lasts. Its characteristic fire form (fuel below, flames above, heat radiating out) self-organizes spontaneously according to physical laws. Another simpledynamic system is a mountain stream that only exists while water flows down a slope transforming gravitational potential energy (the potential of elevated water to fall) into kinetic energy (the energy of movement). When the water supply stops, the stream vanishes. Because the stream encounters constraints in its environment ⎯ perhaps rocks that it must flow around ⎯ its characteristic serpentine form self-organizes, that is, emerges spontaneously without any direction from a blueprint or an engineer. On a mountainside many such *component* dynamic systems, including rainfall, sunshine, wind, trees and other plants, insects, birds and other animals, all interact spontaneously according to simple rules and according to simple constraints provided by the environment. From these interactions emerges the higher-order or higher-level dynamic system that is an ecosystem. The ecosystem is much more complex than the sum of the complexity of its component systems and, though there are no genes for an ecosystem, yet it self-organizes reliably.

It is now entirely accepted that everything that lives is composed of a hierarchy of dynamic systems. Psychoanalysts, meanwhile, have long recognized that a person’s psychology is a dynamic system (Stolorow 1967). If we define the personality as *psychologically based ⎯* a system of thoughts, feelings, memories, ideals and other psychological components[[2]](#endnote-2)  *⎯* then it is fundamentally different from the brain which is *chemically and physically based,* just as a computer’s software is fundamentally different from its hardware. Nevertheless the personality must itself be alive because it satisfies, in its own right, the criteria by which a biologist defines life: the personality responds to its environment, absorbs psychological nourishment, grows, reproduces, adapts, remembers its changes and evolves, evolving not only within each person but also over generations. It follows, therefore, that body (defined to include brain) and personality, though radically different, are two symbiotic or chimerical life forms, each depending entirely upon the other just as algae and fungi depend upon each other in lichen. This idea is somewhat new and may seem strange but there is other evidence for it. Biologists now recognize that most species are symbionts of many different biological life forms (Gilbert et al. 2012). In medicine, Caes, Orchard and Chrisie (2017) discussed clinical evidence that ‘mind and body have symbiotic relationships.’ Meanwhile, the idea that a human is a chimera is very old: 44,000-year-old cave paintings (Aubert et al 2019) and also a 40,000-year-old carved figurine ⎯ see Cook (2017) online for a brief, extraordinary video ⎯ show humans with the heads of other animals. The anomalous head suggests that what the head represents, the personality, is fundamentally different from the body. Still today, when you say ‘I am in a different headspace,’ you mean that you are occupying an alternate version of your personality.

The human personality represents a very high level of structural complexity. One estimate is that human body (including brain) contains about 5x1028 bits of information in its molecular arrangement, about 10 times more than the total number of atoms in the human body (Elman et al. 1996, p. 319). The personality, as we will explain, then constitutes a further elaboration of structural complexity over and above that of the body. A similar example is verbal language ⎯ itself authoritatively shown by Holland and others to be a complex adaptive system (Beckner et al. 2009) ⎯ that also exists at a higher level of structural complexity, over and above the structural complexity of the brain. That the personality level of complexity is reliably achieved for each person presents a profound organizational problem. How is the correct structure specified? Next we show that, because genes have limited informational capacity, the burden of explanation must rest on complexity theory.

Notwithstanding the claims of evolutionary psychology, psychological complexity cannot be specified by genes. One reason is that we have only about 20,000 genes, no more than a tiny roundworm (also 20,000), one of the simplest animals (Kim et al 2018). Another reason is that the human personality evolved from that of a chimpanzee-like ape in only six million years, much faster than the slow pace of genetic evolution (Chimpanzee Sequencing and Analysis Consortium 2005; Lovgren 2005). An overriding reason is that the *only structure* that one gene specifies is the *precise linear sequence* of different subunits that are strung together like a long string of beads to create one individual macromolecule (one molecule of DNA, RNA, or polypeptide/enzyme), for example to create one of the enzymes that catalyzes the Krebs cycle (see below). Beyond such *primary* linear sequences, every other structure in biology, including the highly specific folding of each ‘string of beads,’ is a *secondary* structure that *emerges*, as we explain below, by self-organization, that is, by spontaneous interactions between specific subunits according to simple rules and according to simple constraints from the environment[[3]](#endnote-3) [[4]](#endnote-4). Even the double helical form of DNA is a secondary, folded structure achieved by self-organization.[[5]](#endnote-5)

Next we illustrate complexity theory ⎯ and also summarize the theory behind this paper ⎯ by listing a schematic hierarchy of progressively more complex dynamic systems, a hierarchy that emerged in the course of Darwinian evolution (Walker, Packard & Cody 2017). When each new level of this hierarchy emerged, a variety of similar dynamic systems at that level competed with each other, allowing Darwinian selection to determine which systems prevailed and which were eliminated. The initial, component, simple dynamic systems were *individual chemical reactions,* each of which only exists while energy flows through it (level a). A group of such reactions interacted with each other spontaneously according to simple rules like, for example, the *law of supply and demand* which works as follows. In an ‘assembly line’ of three consecutive chemical reactions, reaction 1 supplies the raw material for reaction 2, which consumes this raw material and transforms it, thus producing the raw material demanded by reaction 3. The *rate* of reaction 2 is controlled not only by the rate of reaction 1 (supply) but also by the rate of reaction 3 (demand). Interactions between the individual chemical reactions are also controlled by environmental constraints, for example by temperature and acidity. From the above spontaneous interactions emerged a variety of *cycles* of chemical reactions, for example the Krebs cycle that begins the burning of carbohydrates. Each such cycle itself constitutes a new dynamic system at a higher level of complexity (level b). In turn, a group of such cycles interacted spontaneously with each other according to simple rules to form a *metabolic system* (level c) and, in turn again, the metabolic system, together with other comparable dynamic systems like the cell membrane and the chromosome, interacted spontaneously with each other according to simple rules to form an *individual living cell* (level d). Then several different kinds of procaryotic (simple) cells interacted spontaneously to form a eucaryotic (complex) cell (level e). Next, a variety of individual cells interacted spontaneously with each other according to simple rules, which led spontaneously to the emergence of *multicellular organisms* (level f), then *brains* (level g). From brains emerged *psychological components,* for example a sensation like hunger or a memory (level h). From a variety of such psychological components, interacting spontaneously according to simple rules and constrained by the environment, emerged *narratives* (level i) ⎯ see below. From the spontaneous interactions, according to simple rules, of many narratives emerged *personality* (level j). The biological transitions listed above, levels a-g, have been definitively proven by the fossil record and the evidence of existing life forms (Maynard Smith and Szathmary 1999). There is also good evidence for the subsequent psychological transitions, levels g-j (McDowell 2010 and 2024).

The above schematic hierarchy traces (approximately) the evolution of life from its chemical beginnings more than four billion years ago (Walker, Packard & Cody 2017) and it also approximately recapitulates the development of each fertilized human egg. Since each new level of complexity encompasses and depends entirely upon all previous levels, at each new level the overall degree of complexity increases geometrically. Such geometric increase easily provides for the very high degree of complexity manifested by the human personality. For more detail see McDowell (2010, pp. 10-15/350-351). The above explanation of complexity now enables us to discuss *homeostasis* which, in turn, suggests the function of dreams and myths.

Every dynamic system, whether it be at a simple level or at any more complex level, has internal homeostatic mechanisms *at that level.* When you run, for example, your body maintains its temperature and oxygen levels by means of lungs and sweat glands and blood capillaries in your skin.On a mountainside ecosystem, the populations of herbivores and carnivores balance each other. When there are too many goats, mountain lions increase in number and thin out the goats; when the population of goats falls, perhaps because of drought, less mountain lions survive. A homeostatic mechanism may take many forms but it is inevitably present at each level, because without it a dynamic system could neither self-organize at that level, nor persist.

A personality and an ecosystem are alike in the sense that both represent levels of complexity higher than the biological level. The immediate components from which personality self-organizes are *narratives* that spontaneously interact with each other according to simple rules, both within each person and between people (McDowell 2010). This idea is familiar to psychotherapists (Angus & McLeod 2004). The work of psychoanalysis is to become more conscious of these narratives ⎯ not only intellectually but also emotionally and socially ⎯ and, through such consciousness, enable these narratives to evolve. However, though most people have no access to psychotherapy, nevertheless a functioning personality emerges reliably. Education from parents, friends and schools helps but there must also be internal homeostatic mechanisms at the level of narrative. What are they?

Like personality, myths (narratives) evolve quickly, are subtle, and are universally present. Like personality, myths and dreams characteristically show abrupt transformations. Your personality changes abruptly, for example, when your belly is filled, or the sun rises, or you fall in love. Jung (1969/1948) and his followers have published a large body of *anecdotal* evidence that myths are homeostatic for personality. A new contribution in this paper is *experimental* evidence for such homeostasis.

It has long been recognized that dreams and myths use the same symbolic language as, for example, in Genesis (41:1-57) when Pharaoh told Joseph his dream. Another example is Edinger’s (1972 pp 138-42) discussion of an image of the Crucifixion in one of his patient’s dreams. Recently, McDowell, Roberts & McRoberts (2024) reported a new experimental system that can falsify or confirm a *dream’s* interpretation. Here we used the same experimental system to test a *myth’s* interpretation. This test was briefly mentioned in the authors’ above (2024) paper.

Here the logic of our experiment is as follows: Because we interpreted the dream of the black planet while knowing nothing of the dreamer beyond age and gender, our very specific predictions about the dreamer had to come from the dream text itself. We subsequently learned facts about the dreamer that could falsify or confirm our predictions and, because the facts confirmed our very specific predictions, they provided *direct experimental evidence* that our interpretation of the dream’s text was accurate. As we interpreted the dream, we discovered that it retold the myth of Saturn who devoured his children. Because the underlying narratives of the dream and the myth were the same, it followed that our experimental evidence supported the same interpretation for both. Our initial hypothesis, that the function of myth is to provide homeostasis for the self-organization of personality, was therefore also supported. To our knowledge, this is the first time a myth’s function has been tested by experiment.

**Method**

We interpret a dream in an online, 90-minute class. Our interpretation technique originated with Jung, was developed by subsequent analysts, and was published by Whitmont and Perera (1989). The instructor (mjm) has since developed it further. One of his innovations is that, because a dream reveals much personal information, he teaches the interpretation technique using only the text of the dream plus the dreamer’s age and gender. The dreamer has given permission to have the text analyzed but is not present and is not known to anyone but the class member who brought the dream. While we interpret, the *bringer* of the dream listens but remains silent and offscreen.

At this point we have none of the dreamer’s associations to the images. Though experts insist that interpretation requires the dreamer’s associations, we find otherwise (McDowell, Roberts & McRoberts 2024 pp 22-23). When a therapist and a patient work together on a dream, in order to interpret more quickly and more completely, they must use the dreamer’s associations. Not to do so would be irresponsible. Consequently, they interpret the *associations* as much as the dream *text* and, since time is limited, they may neglect the details of the text. Moreover, it is impossible to know how much of their interpretation was derived from the text alone. By contrast, our classroom protocol forces us to pay close attention to each detail of the text. Each detail was remembered and recorded because it has meaning.

Another innovation is the instructor’s discovery of *repetition*, by which we mean that a dream (or myth) is like a poem that finds a series of apparently unrelated images to encode a single meaning. Repetition allows the class to forgo associations because it provides an internal check during the interpretation. Repetition also means that a dream is like a hologram in the sense that the overall meaning is encoded repeatedly in different parts of the dream. We can interpret, therefore, even when the written text does not include the whole dream. As with a hologram, the more complete the text, the sharper the resolution of the interpretation. This hologram-like structure is apparent in the dream of the black planet.

Another advantage of our protocol is that, when the interpretation is finished, we can test it empirically by having the bringer (and sometimes, later, the dreamer) tell us more about the dreamer. Yet another advantage is that, because we work online, we can easily record the entire class as raw data for subsequent analysis. All of the above means that the class becomes a simple and productive *experimental system*. Previously we evaluated the design of this experimental system in detail (McDowell, Roberts & McRoberts 2024, pp 27-28).

**The Dream**

At age 30 the male dreamer gave the bringer this ‘recurring dream.’ After we had interpreted it, the dreamer said he had the dream when he was 23 or 24.

I’m driving in a car with Dad. We are crossing a really, really long bridge over a body of water. A vast planet rears up before us, dwarfing the rest of the scene. I know it isn’t real, that it’s created by a particular atmospheric phenomenon that brings a planet that exists in the sky elsewhere, but full scale. Although I know it isn’t real, the scale of it is so immense it terrifies me, so I clench every muscle in my body. My father is not alarmed. Once we pass the edge of the image and are inside the illusion, no light from outside enters it, so the inside is completely black, so there is no light from any direction. After we drive through the blackness awhile we arrive at a kind of tollhouse or rest stop halfway along the bridge. We park in the little lot and go inside. There are a few other people inside and there are windows, but they look out on the blackness, so the only light is artificial light.

**Results:**

The numbers below identify paragraphs in the complete transcript of the class (see Appendix). Until paragraph 150, we interpreted the dream knowing nothing of the dreamer except that he was 30 and male. The bringer had switched off her camera and did not speak, which meant we received no visual or verbal information from her while we interpreted.

In paragraphs 150-167 the bringer began to tell us what she knew about the dreamer, thus providing a test for our interpretation. After paragraph 167, the whole class, including the bringer, continued to discuss the dream but this final discussion was not part of the experimental test. Our interpretation generated five falsifiable predictions. Below we give evidence from the transcript that we made these predictions, followed by evidence from the bringer against which we test each prediction. During the class, we did not articulate our predictions as concisely as we do here. The Appendix includes both a complete transcript and an audio-record of the entire class.

**Predictions that were falsified, confirmed or supported**

**Prediction 1 with evidence that we made it:**

 *The dreamer is not sufficiently separated from his dad. He is in the grip of a father complex of which he is unconscious. He needs to take responsibility for his own individual journey through life.*

Class member: He is in a “father complex-related issue in a car which is sort of a vehicle that you move in your life. Very protected environment (3).”

Instructor: “Yes … Dad’s doing something that he also does and he may even have learned how to drive from his dad (4). It does say ‘I am driving in a car,’ but he could have said ‘I am driving a car with dad.’ Then he would be the driver, probably. So there’s an ambiguity; an interesting ambiguity because there’s lots of ways to say that sentence that make it clear who’s driving. Right? It's not at all clear who’s driving the car. Maybe that’s interesting, psychologically (6) …”

Cm. “Autonomy. Traveling not communally but solo or with a smaller group. A little bit more self-determined (18).”

 Inst. “Yes, so there is something about individuality here. Because if you are in a train or a bus it is specifically about a bunch of people. This is a journey, but it's about an individual, so we could say already we suspect this is about the development of individual personality. A bicycle would mean the same thing. A horse would mean the same thing. If this dream were in the middle ages he might be riding a horse with his dad. Same idea (19).

 Parental complex [is] very convincing … It takes a lot of work to be able to not be emotionally possessed by them (70). This planet is brought to the dreamer’s vision by spirit, by thoughts, by ideas (87) ... complexes are created out of attitudes and ideas, fears that we have. So that’s an example of repetition (88).

I’m guessing it’s a complex, because it [the planet] is so alarming, and it creates such terror, and yet we are specifically told it is not actually a physical threat, because it is far, far away. It's just an image, it's just an idea. It’s not a reality. That’s what makes me think it’s a complex (93).”

Cm. “It reminds me of a black hole. There is so much darkness that even the light cannot get through (107) … it’s some sort of depression (109) You are blind to reality (111).”

Inst. “You are blind to reality. When it’s really got you, you can’t see that it’s just a complex (112). We are inside a house, and there’s no light coming in the windows, so we are right in the heart of a complex (113). It's a collective place, so this is a collective kind of complex (118).

 Whose driving? We don’t know. Maybe the dreamer doesn’t know who is driving the car. I think that’s a repetition of what you were saying … that this is time for him to be driving the car. You’ve got to put dad in the passenger seat, maybe in the back seat. At least he’s got to be in the passenger seat. The young man has to drive the car. That’s the way it should be. If the dad is driving the car and the 30-year-old man/boy is sitting in the passenger seat, that’s probably a bit of an issue (130).”

**Evidence that confirms prediction 1:**

Bringer. “A couple of people mentioned that maybe this was a traumatic kind of dad or he had difficult relations. I would say a less involved kind of dad. Does that make sense? Not a scary dad, more like maybe an uncertain dad or a dad who was not really hands on with the kid (152).

He [the dreamer] has a kind of attitude, suffers from a pessimism that is so pervasive that it's a kind of joke with his friends: ‘So much complaining! So much pessimism!’ [He] struggles to feel competent, struggles to feel like ‘I can do it, I have what it takes.’ And that might have something to do with his relationship with his dad, who is a very nice man, but maybe ... not such a great model, always (156). He thinks his parents are really great, like really perfect. Like it's weird in people who are 30 (158). [He says] ‘It's kind of weird that I am always drawn to these people who have a lot of difficulties and have these traumatic childhoods. And then they tell me that “Oh this happened to me and then that happened to me” and I’m like “Oh nothing happened to me and I have no explanation for how I am.”’ Which is kind of a funny insightful kind of way for someone to be. He’s very psychologically minded. (159)

He went to art school and works in a bookstore now. Kind of likes being a book seller (160). An ongoing issue around efficacy. Around feeling like ‘I can make up my mind what needs to happen for me and I can do it.’ He tends to flop over into a ‘Oh everything, I can’t … it's too hard.’ Not it’s too hard, it’s like ‘Life is so sad (161).’

Decided he’s never having kids. Oh, and he’s a vegan. So, concerned about harm minimization, right? So being a vegan is about minimizing your harm to people. Not having kids is like minimizing the people who are going to suffer in the planet. But it lacks a kind of spirited moving toward (162).

[Dad is] a very accomplished guy without a lot of confidence. His dad is a guy who has done a lot of really cool things in life, but always a little feeling ... not empowered. I think that is where it comes from. It’s maybe a family trait. Like ‘Oh it’s weird I’ve done so well and people know about me and I’m an expert… and I still feel like a can’t do …I don’t know how this happened, I don’t fully inhabit that (164).’”

**Prediction 2 with evidence that we made it:**

 *Behaving like his father, the dreamer is not struggling enough to deal with his unconscious predicament. He stays above it in too heady a psychological place and avoids engaging with his emotions (which means he avoids life’s demands).*

“Body of water to me is the unconscious and all the content inside (21). [Water] also often represents emotions [because emotions have different temperatures and seem to flow though our bodies like fluids] ... particularly in [educated] western society where we tend to live a lot in our intellect and we are often not so in touch with our emotions … mostly in western society people can tell you what they are thinking but will have to do more work to tell you what they are feeling (24)

It's a big body of water. A really long bridge, over a bay or something. This tells us more; what kind of unconscious? It's not a bathtub, or a swimming pool. So, personal unconscious? (25). Well it looks like the threshold between personal in a car and a huge body of water, so collective unconscious (26)

 A certain kind of wildness. Can’t be contained because of its size? (29). You could drown in it. A storm could swamp your boat, or potentially even wash away your bridge (30). It includes danger right? It's not necessarily safe. It's certainly outside the control of the ego. Nobody can control a huge body of water. A huge body of water does what it wants (32).

 We could have dreamt we were floating in the water. That’s not the case. We are on a bridge (33). Every single detail is significant. Every detail is telling the story (34). A safe way to traverse this large powerful force (35)? Do you feel entirely safe on that bridge? (36). Not at all, it's terrifying (37). I don’t think the image is one of safety, I think it is the image of something else (38). It’s obvious. You have to look at the image and say ‘exactly what is the image showing us?’ This is a visual language (39). The dreamer has a perspective. It’s looking from above (40). Yes, you are above it. It gives you perspective. Although that’s interesting, because when you are above water, you don’t really see the water better ... It actually separates you from the water. It’s a way of staying above the unconscious (41).

 It’s the intellect looking at the emotions from above, or consciousness looking at the unconscious from the outside (42). You could get that kind of perspective by standing on the edge of a cliff overlooking the sea. But you are on a bridge. What does that tell you? Who makes cliffs and who makes bridges? (43). It’s a point of view or an attitude towards the unconscious which has been constructed by the collective. A human viewpoint. A cultural viewpoint above [avoiding] the unconscious, of looking at the unconscious from the outside of it (42, 45).

 There is some idea of where they are going and suddenly they are presented with this crazy big planet and the dreamer then begins to try and rationalize why it's there through this scientific explanation (60).

 When I go on a psychological journey with my dad. We travel above a huge amount of collective unconscious material. We are not sailing in it, we are above it, looking at it from the outside. It's big. There is a lot of unconscious stuff that maybe me and my dad [both] have to deal with. Or I have to deal with, with regard to my dad (115).

‘My father is not alarmed.’ I love that sentence. What does that tell you? (97). If we go with the ‘complex’ [idea], then even ‘my father is not alarmed’ is another repetition (98). The father doesn’t notice the alarm. Which is alarming (100). Yes, we are back to … dealing with a father complex here (99). My father is fine about it. He doesn’t see it or he doesn’t care. It’s not his problem as far as he’s concerned. It seems to be entirely my problem. So maybe I’m more conscious than he, maybe I’m the one who has to deal with this complex and it's invisible to him apparently, or at least so familiar that he doesn’t think about it. It completely blinds us [both] (117).”

**Evidence that confirms prediction 2:**

[Some evidence is repeated here because it supports more than one prediction.]

 B. “[The dreamer is] somebody who struggles to feel competent, struggles to feel like ‘I can do it, I have what it takes.’ And that might have something to do with his relationship with his dad, who is a very nice man, but maybe not such a great model (156).

[The dreamer said] ‘It's kind of weird that I am always drawn to these people who have a lot of difficulties and have these traumatic childhoods. And then they tell me that “Oh this happened to me and then that happened to me” and I’m like “Oh nothing happened to me and I have no explanation for how I am.”’ Which is kind of a funny insightful kind of way for someone to be. He’s very psychologically minded. (159)

Yes, went to art school and works in a bookstore now. Kind of likes being a book seller (160). I think this person has an ongoing issue around efficacy. Around feeling like ‘I can make up my mind what needs to happen for me and I can do it.’ He tends to flop over into a ‘Oh everything, I can’t … it's too hard.’ Not it’s too hard, it’s like ‘Life is so sad’ (161). This is a guy who has decided he’s never having kids and he’s a vegan. Concerned about harm minimization, right? Being a vegan is about minimizing your harm to people. Not having kids is like minimizing the people who are going to suffer in the planet. But it lacks a kind of spirited moving toward (162).

Yes, very accomplished guy [dad] without a lot of confidence. His dad is a guy who has done a lot of really cool things in life, but always a little feeling like, not empowered. I think that is where it comes from. It’s maybe a family trait. Like ‘Oh it’s weird I’ve done so well and people know about me and I’m an expert… and I still feel like a can’t do …I don’t know how this happened, I don’t fully inhabit that (164).’”

**Prediction 3 with evidence that we made it:**

 *He defends against his feelings and his predicament by somatizing, by “clenching all his muscles”. This is not a productive defense: it does not help him to work things through and thus resolve his impasse.*

 “‘It’s so immense [the black planet], it terrifies me, I clench every muscle in my body’ The dream didn’t have to say that. What is the dream telling you now? (94). Even though it [the dream] has rationalized the image, the body does not believe it (95). Yes. When our body clenches up like that, what do we call that psychologically? If you have a patient whose body is all frozen up because all the muscles are clenched, that’s somatization isn’t it? This complex is severe enough that the person feels it in their body. People’s spinal muscles clench up and they get sciatica if they’re angry and they’re not in touch with their anger, so they can somatize it. Here’s this guy somatizing his feelings about this complex (96). And indeed a huge reality rears up at me and is terrifying, seems totally convincing, even though it is an optical illusion that it is so close. My whole body tenses up, I have powerful somatic reactions to this complex (116).

 Clenching muscles is a protective thing, a way of keeping out, trying to keep something out, trying to push something out. So I wondered about the way in which this [black planet] is being dealt with. One way is to just try to back off or self protect and not engage with the terrifying aspect of it (132). Yes and it's a very unproductive way right? Maybe it works but it's not processing it, clenching up is not dealing with the situation. And somatizing does that for you. If the muscles in your back clench up and you have back ache, or sciatica, worse yet, maybe you get a herniated disk, that’s a way of trying to control your stress, but it’s not a productive way. Better you should see a shrink, or get a massage, or do body work. Start to process this somatized stuff (133).”

**Evidence that confirms prediction 3:**

B. “He [the dreamer] has asthma. Which is an interesting image of clenching, you know when your lungs clench and you can’t get a deep breath (155).

 And I would say has a kind of attitude, suffers from a pessimism that is so pervasive that it's a kind of joke with his friends. ‘So much complaining! So much pessimism!’ You know. I think it is somebody who struggles to feel competent, struggles to feel like ‘I can do it, I have what it takes (156).’ I think this person [dreamer] has an ongoing issue around efficacy. Around feeling like ‘I can make up my mind what needs to happen for me and I can do it.’ He tends to flop over into ‘Oh everything, I can’t … it's too hard.’ Not it’s too hard, it’s like ‘Life is so sad (161).’ And that might have something to do with his relationship with his dad, who is a very nice man, but maybe not such a great model (156).”

**Prediction 4 and evidence that we made it:**

*The dreamer’s clenched muscle, a lived bodily reality (his somatized defense), may have been transmitted to him psychologically (through emotions, attitudes, and ideas) from his father’s lived bodily reality.*

“It's big but it is a planet. If you really wanted to go big you could just look at the whole galaxy, or the whole universe. So that would be big too, but this is as big as a planet, which is interesting, because where do we live? On a planet and this is another planet, a planet we don’t live on. That’s what we are looking at. There is a suggestion of an alternate reality. It’s a parallel planet. What does that suggest, psychologically? I don’t know the answers to these questions as I ask them, I’m exploring it with you. What does a parallel planet suggest? (52). When you travel to another country you are confronted with another culture, and it gives you a whole interesting perspective on the culture you come from. This [another planet] would be another perspective with a vengeance (54).

 And that’s interesting because you didn’t have to travel very far to find this perspective, it was brought to the dreamer by an atmospheric trick. Which tells you a lot. Look at how this planet arrived here. How did it arrive? Is it really there? Are you in danger of being sucked up by it's gravity and lifted off of this planet and drawn into the other planet by it's gravity? Yes? No? The dream answers that question. What does it tell you? (55).”

 Cm. “I think because it's dwarfing the rest of the scene, it sounds like it’s very powerful (56). Yes, the way it’s dwarfing the scene like nothing else is there (58).”

 Inst. “Yes, but what the dream is saying is more subtle than that. It would feel extremely powerful (59). The dream specifically explains that this vision is created by a particular atmospheric phenomenon that brings a planet that exists elsewhere, but you get to see it full scale. This is long-distance seeing. Some freak of the atmosphere; it’s like a mirage, you get to see this planet as though it’s up close but really it’s far, far away. The dream is making that point. You feel as though this thing is going to swallow you up, but actually it’s a mirage, it’s a long way away. So what does that tell you? Psychologically? (61).

 It doesn’t actually have to destroy your life. I think that’s what the dream is hinting, but it's also playing with that idea, because it’s alarming even to read. Even as you read it you feel like the planet is real, you have to pay attention to realize that it is not actually there. It is a real planet, but it’s not actually in front of [the dreamer] even though you feel like it is. So it is [an] effective illusion (65). How was it [the illusion] created? (73). The atmospheric phenomenon? (74). What is atmosphere? (75). Air (76). What is air psychologically? (79).”

 Cm. “Some sort of spirit… It almost feels like spirit creates [an] illusion of some sort of creation myth. Like in the bible where you have the light and planets and water (83).”

Inst. “Yes, air is related to spirit. And by ‘spirit,’ if we interpret the idea rather than think of it in a mythological sense, spirit is what moves us, the thoughts, the ideas, the attitudes, the beliefs that move us. Just as the air, the wind moves us. Spirit is the stuff of thought that approaches us and changes our minds (86). So this planet is brought to the dreamer’s vision by spirit, by thoughts, by ideas. (87).

 Cm. “I see another addition. The fact that this big planet, this big spiritual content is somehow connected with the body, with the physical body, there is some kind of connection, some bridging between the spirit and the muscle in my body (102).”

Inst. “To take that a little bit further, the planet is not a spiritual content. This planet is solid, earthy. It’s not earth but it’s made of rock. The vision of it is the psychological perception [spirit] of it. But what he’s looking at is something every bit as dense and clenched as clenched muscles. The other planet is like one big clenched muscle. And when he [the dreamer] sees it his [own] muscles clench up. So it [the planet] is affecting the [dreamer’s] body, the earth, and it [the planet] is itself something of matter [planetary rock]. But it’s effect [the means by which it is transmitted] is psychological (103).

 So you might say it’s ... the lived reality of the father which is having this fierce effect on the lived reality of the dreamer, by means of his [the dreamer’s] complex. That’s just a guess. But it might be something like that (104).

It’s one thing to have a father who discusses politics with you … and it’s another thing to have a father who is dead set on an extreme political position and is living it in his own life … and then that’s what you have to deal with. It’s like solid, dense, if it’s actually happening (105)”.

**Evidence that supports prediction 4:**

 B: “The dad had a very difficult time as a child medically. He had great parents but he was in a hospital all the time. That’s like the other kind of really difficult childhood that people don’t talk about. Not just were your parents difficult for you, but also, were you sick all the time? Because he was. And I think that may have created that personality somewhat (165). “

Inst. “The dad was sick all the time? (166).”

B: “Yes. I would say that causes a lot of anxiety, if you are chronically ill, because you never know when you are going to be sick, and you are afraid of investing too much energy into anything because then you might get sick. And then I think that just was part of this dreamer’s growing up, a kind of cautiousness about … (167).”

[Thus the bringer confirmed that the dreamer’s somatization is likely a reflection of the somatic reality of the father – the father’s prolonged childhood illness.]

**Prediction 5 and evidence that it was made:**

*The ending of the dream suggests a major depression.*

Cm. “Windows is something that you look on a wall, they are a point of view. And there is glass usually so there is not much emotions involved and then you look outside through the glass and there is nothing there (143).”

 Inst. “He’s just trying to look through window, is that what you are saying, it's passive? (144).”

 Cm. “Yes, it is very passive. And sometimes bridges are connected with suicide. Sometimes, you know, old times, bridges were places where people used to commit suicide. I wonder if there is some sort of depression, like really a major one, that bring him to very dark place (145).”

**Evidence that falsifies prediction 5:**

 B. “He’s a comics artist, this guy. He draws comics and graphic novels. Has always been pretty sensitive, insightful. Is actually really interested in Jungian psychology (154). He thinks his parents are really great, really perfect. It's weird in people who are 30, right? (158). He’s just started to date a new woman and he was like ‘They have a lot of difficulties and it's kind of weird that I am always drawn to these people who have a lot of difficulties and have these traumatic childhoods. And then they tell me that “Oh this happened to me and then that happened to me’ and I’m like ‘Oh nothing happened to me and I have no explanation for how I am.’ Which is a funny, insightful way for someone to be. He’s very psychologically minded (159). Went to art school and works in a bookstore now. Kind of likes being a book seller. Very story oriented, and obviously for an artist, image oriented (160).”

These words from the bringer do not indicate major depression.

**Discussion:**

Prediction 5 was falsified. In retrospect, there was little evidence to make prediction 5 in the first place. Being unconscious does not imply being depressed. Predictions 1 through 3 were confirmed and prediction 4 was supported.

At least four other predictions were rejected immediately because the details of the dream contradicted them: paragraphs 35-8; 47-8; 51-2; 56-9. A review of the transcript (Appendix) shows that, besides predictions 1-5, no other predictions were made without being immediately rejected. This shows that, in presenting our results, we have not cherry-picked predictions we already knew would be supported by the bringer’s information.

**Subsequent insights about the dream**

When the experiment had been completed, the whole class, including the bringer, continued to explore the dream further*.* This led to the following discussion:

 177. Bringer. “I thought about the toll house, being halfway along the bridge, and it really reminds me of that very first line of Dante’s *Inferno*: ‘In the middle of my life I found myself lost in a wood.’ It’s unusual because the dreamer is 30; that’s not the middle of your life. But I think it implies

*you’ve stopped at a vantage point, but there is no light; you are inside but you can’t look out of the window.”*

 179. B. “Where I live, the Chesapeake Bay Bridge is a really long bridge and it has a restaurant in the middle of it and it's got a great view! But this little toll house is sad and twilight zone-y. You go in and everything is dark outside. It's not a vantage point. You are halfway but it doesn’t do you any good.”

180. Cm. “It’s also the place where you pay the price for the journey. You pay for this kind of life in some way.”

183. Cm. “And that is part of maturation as well. The cost. Paying for things, psychologically, or just being engaged in that way.”

184. B. “… you have a little fight with your parents, or you do what they don’t want you to do, or you are displeasing to them, and it's the price you pay for being yourself.”

185. Inst. “Or if you don’t, then there is a price you pay for that. If you travel in this above-the-surface way, there’s a cost to that.”

186. [On subsequent reflection, the instructor saw that, if you travel in your father’s car, then you may not have to pay for anything. You may be only ‘going along for the ride’.]

187. Cm1. “He was able to see the tollhouse, they are in the blackness, but then they see the tollhouse … he’s seeing the little lot, even though he was all conflicted, and had somatization and being afraid, he goes into the toll house. So there is something that maybe is about moving forward or going on.”

 189. Cm2. “… there is just pointing inside. Maybe … you find some hope, or solution, or help, or guidance [from] this dream if you go inside.”

190. Inst. “But if you look at what the dream is saying, it’s not offering any help. The lot is little and when you go inside there is still no light. I think *you* want there to be light here, so maybe you are projecting a wish onto the dream, but the dream is actually not very favorable or friendly to this situation.

192. … the dream is not telling … this 30-year-old his future, but it is challenging his attitude:

*Look buddy, nothing much has happened so far and you are not in a very good place here now, there is not much light now, so maybe it’s time for you to get alarmed.*

It’s not being kind about it.”

Later the instructor saw that we had missed the dream’s precision about timing. Our interpretation method states, from generations of experience (Whitmont and Perera, 1989 pp 71-78), that the setting of the dream — in the car with his father, not clear who is driving — gives the current psychological situation while the rest of the dream gives likely or possible future developments. The tollhouse, therefore, lies in the dreamer’s future: as the bringer pointed out, the dreamer’s current age, 30 or 24, is not the midpoint. Thus the dream is saying:

*If you continue as you are then, when you reach the midpoint of your life, you will still be blind to the father issue that already arrests your development. You will pay a price for that.*

Shakespeare (1609) used a similar allegory:

[The sun]

Having climbed the steep-up heavenly hill,

Resembling strong youth in his middle age,

Yet mortal looks adore his beauty still,

Attending on his golden pilgrimage:

But when from highmost pitch, with weary car,

Like feeble age, he reeleth from the day,

The eyes, 'fore duteous, now converted are

From his low tract, and look another way:

 So thou, thyself outgoing in thy noon,

 Unlooked on diest unless thou get a son.

The dreamer, likewise, planned not to have children. Sonnet and dream both deploy a dramatic image from the solar system. Each is impatient with a man for choosing immaturity and each tries to shake him out of it by showing him the cost.

**Conclusion**

In the experimental phase of this class (paragraphs 1 ⎯ 177), we predicted and subsequently confirmed that the dreamer is psychologically overwhelmed and blinded by the black planet that represents a devouring father complex. The dreamer somatizes his problem. He is not developing independence or maturity appropriate to his age. The son’s somatization is probably linked to the father’s own somatic life.

What more can we conclude from our results? The reference to the myth of Saturn is unmistakable: the black planet appeared to be immense (symbolically, larger than earth); the planet was apparently a near-earth neighbor (Saturn is one of the large, near-earth planets); the planet ‘devoured’ all the light (it devoured consciousness, as does a complex); and the dream referred, specifically and repeatedly, to a psychologically devouring father (in the driver’s seat?). The drama of this planetary image seeks to penetrate the dreamer’s defenses and awake him to his father problem. *Thus, our experiment* *supported the hypothesis that* *the purpose of the myth of Saturn is to forewarn against a psychologically devouring father complex*.

We showed previously that our experimental design is rigorous (McDowell, Roberts & McRoberts 2024). Seven additional documented iterations of the experiment, each with a different dream, confirmed that the results are reliably repeatable. Several of these iterations also referred to myths: one confirmed that the god Mercury bears messages (McDowell, Roberts & Moadeli 2023); another confirmed that mythical birds, like Odin’s crows, represent ideas because they travel through the air (McDowell, Roberts & Hausman 2023) ; another confirmed the meaning of a goddess that was both a chimera and the Earth Mother (McDowell, Roberts & McRoberts 2024).

 Here we integrate experimental science and the interpretation of symbols. We hope that the experimental system described here may prove useful. Experimental evidence allows you to support a deduction repeatedly until you become confident that it is accurate, no longer a matter of opinion, no longer one of many possibilities but rather a conclusion supported by repeated objective tests. With an experimental test you can convince others and you can also pursue further research. If you have secure steppingstones, you can advance further into unknown territory: you are less likely to fall into ungrounded speculation.

 Deciphering the narrative of a dream or a myth allows you to observe the *process* by which a personality self-organizes from narrative. Your method of observation is not indirect, as is the case for statistical studies of dreams, but rather direct and immediate, as though you were watching under a microscope as the cells of a living embryo divide and migrate. Direct observation is more revealing, more likely to discover something unexpected. For example, the dream refers implicitly to a new allegory that compares the arc of life to a drive across the Chesapeake Bay Bridge. Here the meaning of the tollhouse changes:

 *You should separate, not only from your parents but also from the collective, to pursue your own direction. By the time you reach the midpoint you should have conscious perspective, and you should be ready to pay the price for that maturity.*

When we discovered this new allegory, we were surprised to discover also that it evoked feelings of independence, consciousness and self-worth. These feelings support a sense of purpose and meaning that does not depend upon religious belief (McDowell 2001, pp. 649-651).

Though our experiment supports our hypothesis that myth stabilizes personality, you may not need to rely on experimental logic alone. Because the feelings noted above (independence, consciousness and worth) all strengthen your sense of self, they may allow you to experience for yourself, in the moment, that the allegory of the Chesapeake Bay Bridge stablizes personality.

Any animal that has personality must necessarily have narrative-level homeostatic mechanisms to stabilize that personality. Thus it makes sense that many different species dream, including at least some birds and most mammals (Pena-Guzman 2023). Because the human personality is so complex, it also makes sense that, amongst all groups of humans, there has arisen a body of myth.

**References**

Angus, L. E, and McLeod, J. (Eds) (2004) *The Handbook of Narrative and Psychotherapy: Practice, Theory, and Research.* Sage Publications.

Aubert, M. Lebe, R. Oktaviana, A.A. Tang, M. Burhan, B. Hamrulla, Jusdi, A. Abdulla, Zhao , J-X, Hakim, B., Geria, I. M., Sulistyarto, P. H., Sardi, R., Brumm, A. Earliest hunting scene in prehistoric art. *Nature.* 11th Dec 2019.

https://www.nature.com/articles/s41586-019-1806-y

 Beckner, C., Blythe, R., Bybee, J., Christiansen, M. H., Croft, W., Ellis, N. C., Holland, J., Ke, J., Larsen-Freeman, D., Schoenemann, T. (2009) Language is a Complex Adaptive System: Position Paper. *Language Learning* 59: Suppl. 1, December, pp. 1-26

<https://doi.org/10.1111/j.1467-9922.2009.00533.x>

Campbell, J. (1949/73). *Hero with a Thousand Faces*, Bollingen Paperback, p. 91.

Cook, J. (2017). *Living with the Gods: the 40-000-year-old Lion Man*. British Museum.

<https://www.youtube.com/watch?v=mJWUPBQpX1c>

Chimpanzee Sequencing and Analysis Consortium (2005). Initial sequence of the chimpanzee genome and comparison with the human genome. Nature, 437: 69-87. <http://www.nature.com/nature/journal/v437/n7055/full/nature04072.html#a25>

Edinger, E. F. (1973) Ego and Archetype. Pelican, New York

Gilbert, S. F., Sapp, J., Tauber, A. I., Thomson, J. D. & Stearns, S. C. (2012) A Symbiotic View of Life: We Have Never Been Individuals. *The Quarterly Review of Biology,* December 2012, Vol. 87, No. 4 pp 325-341.

Holland, J. H. (1992). Complex Adaptive Systems, In: A New Era in Computation, *Daedalus* 121, 1, pp.17-30 (M.I.T. Press).

https://www.jstor.org/stable/20025416

Holland, J. H. (1998). *Emergence: From Chaos to Order. Perseus Books,* Reading MA. pp. 1-14, 115-18, 121-24, 141-142, 188-190, 202-220, 225-27.

Jung, C. G. (1969). General Aspects of Dream Psychology (R. F. C. Hull, Trans.) In H. Read. et. al. (Eds.), The Collected Works of C. G. Jung: Vol. 8. The Structure and Dynamics of the Psyche (2nd ed., p. 245, paragraph 469). Princeton University Press. (Original work published 1948)

Kim, Y., Park, Y-J. , Hkwang, J-Y., Kwack, K-B., (2018) Comparative genomic analysis of the human and nematode *Caenorhabditis elegans* uncovers potential reproductive genes and disease associations in humans. *Physiol Genomics* 50: 1002–1014.

doi:10.1152/physiolgenomics.00063.2018.

Lovgren, S. (2005). Chimps, humans 96 percent the same, gene study finds. National Geographic News, August 31.

 <http://news.nationalgeographic.com/news/2005/08/0831_050831_chimp_genes.html>

McDowell, M. J. (2001) Principle of organization: a dynamic-systems view of the archetype-as-

such. *Journal of Analytical Psychology* 46(4) 649-651.

Available online as ‘The three gorillas: an archetype organizes a dynamic system,’ (see last four sections). <https://web-archive.southampton.ac.uk/cogprints.org/1836/1/jap94web.html>

McDowell, M. J. (2010). Autism’s Direct Cause? Failure of Infant-Mother Eye Contact in a Complex Adaptive System. *Biological* *Theory* (MIT Press) 5(4) 344-356.

 <https://philpapers.org/rec/MCDADC>

McDowell, M. J., Roberts, J. E, & Hausman, N. (2023). The Dream of Geese Nesting in Trees: Interpretation Tested by Experiment. Draft.   <https://philpapers.org/rec/MCDTDO-15>

McDowell, M. J., Roberts, J. E., & Moadeli, O. (2023) The Dream of Mercury: Interpretation Tested by Experiment. Draft. <https://philpapers.org/rec/MCDTDO-18>

McDowell, M. J. (2024). A Parsimonious Solution to the Hard Problem of Consciousness: Complexity and Narrative (submitted for publication, in review).

<https://philpapers.org/rec/MCDAST-3>

McDowell, M. J., Roberts, J. E. & McRoberts, R. (2024), Interpretation Tested by Experiment: The Dream of the Six-legged Dog. *International Journal of Dream Research.* April, 7:1, pp 22-31. <https://journals.ub.uni-heidelberg.de/index.php/IJoDR/article/view/99406>

McDowell, M. J., Roberts, J. E. & Roth, A. (2024), Experimental evidence for the meaning of the myth of Saturn.

Appendix (complete transcript of class): <https://philpapers.org/rec/MCDTDO-13>

Audio record of class: <https://youtu.be/TKT7-bsont0>

McGinn, C. (2007). *Shakespeare’s Philosophy: Discovering the Meaning Behind the Plays,* Harper Perennial.

McGhee, G. (2011). *Convergent Evolution: Limited Forms Most Beautiful.* (Vienna Series in Theoretical Biology) M.I.T. Press.

# McGhee, G. (2019). *Convergent Evolution on Earth: Lessons for the Search for Extraterrestrial Life* (Vienna Series in Theoretical Biology) M.I.T. Press.

Ma’ayan, A. (2017) Complex systems biology. J R Soc Interface 14:20170391.

http: doi.org/10.1098/rsif.2017.0391

Mazzocchi, F. (2008) *European Molecular Biology Organization Reports* 9:1.

https://www.embopress.org/doi/full/10.1038/sj.embor.7401147

Panofsky, E. (1939/1967). Father Time (in) *Studies in Iconology,* Routledge.

Pena-Guzman, D. M. (2023). *When Animals Dream: The Hidden World of Animal Consciousness.* Princeton University Press (paperback).

Shakespeare (1609) *Shakespeare's Sonnets,* Sonnet # 7

Whitmont, E. C., & Perera, S. B. (1989). *Dreams: a Portal to the Source*. Routledge.

Stolorow RD (1967) Dynamic, dyadic, intersubjective systems: an evolving paradigm for psychoanalysis. *Psychoanalytic Psychology* 14(3): 337-346.

<http://integral-options.blogspot.com/2012/01/robert-stolorow-dynamic-dyadic-inter.html>

Walker, S. I., Packard, N., Cody, G. D. (2017). [Re-conceptualizing the origins of life."](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5686397) [*Philosophical Transactions of the Royal Society A*](https://en.wikipedia.org/wiki/Philosophical_Transactions_of_the_Royal_Society_A). 375 (2109):20160337.

[doi](https://en.wikipedia.org/wiki/Doi_%28identifier%29):[10.1098/rsta.2016.0337](https://doi.org/10.1098/rsta.2016.0337). [PMC](https://en.wikipedia.org/wiki/PMC_%28identifier%29) [5686397](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5686397). [PMID](https://en.wikipedia.org/wiki/PMID_%28identifier%29) [29133439](https://pubmed.ncbi.nlm.nih.gov/29133439).

1. If a complex dynamic system develops the capacity to *record* (remember)its changes as it adapts to its environment, it can evolve. Hence the term complex *adaptive* system. [↑](#endnote-ref-1)
2. Our inclusive definition is compatible with most theories of personality, for example with trait, type, psychoanalytic, behaviorist, social cognitive, and humanistic theories. [↑](#endnote-ref-2)
3. A gene is a linear sequence of four *bases*: A, T, G and C, which, when strung together like beads, become a long strand of DNA. When the function of that gene is needed, its *base sequence*, read as a long series of triplets, is translated into a corresponding *amino-acid* *sequence*, a linear array of twenty-one different amino acids. If a substitution happens in the DNA sequence (e.g. one triplet AAA changes to GAA), then this *mutation* codes for a substitution in the corresponding amino-acid sequence. [↑](#endnote-ref-3)
4. The length of an amino-acid strand varies from about 50 to 33,423 for an outlier sequence that gives muscle its spring. A form emerges only as the amino-acid strand grows longer and, at the same time, spontaneously folds into a specific, tight, three-dimensional structure called a protein (an enzyme is a protein). This spontaneous folding is an example of self-organization. The amino-acid sequence is linear, while the final folded structure is subtle and complex.

An amino acid is a small molecule made up of an invariant part, by which each amino acid bonds to the next, and a short side-chain of atoms that is different in each of the twenty-one amino acids. A side-chain is either *hydrophilic* (attracted to water, as salt is) or *hydrophobic* (repulsed by water, like oil). Thefinal form into which a sequence of amino acids folds is a consequence not only of the different chemical elements (atoms) in the side-chains but also of the different sizes of the side-chains and of whether the side chains are hydrophilic or hydrophobic, which latter determines the force between each side-chain and the water that surrounds the protein (more accurately, the protein is surrounded by a dilute salt solution whose salinity, acidity, and temperature are critical). The protein spontaneously folds to ensure that each hydrophilic side chain is optimally exposed to water, while each hydrophobic side-chain is folded inside, away from the water.

This creates myriad opportunities for complexity because a single mutation in the DNA may replace a hydrophilic amino acid with one that is hydrophobic, or vice-versa. One such replacement may dramatically change the folding, creating a new protein with quite different properties that can evolve to serve a completely different function. But, while the sequence of amino acids *enables* an invariant folded form to emerge, the sequence is not a blueprint for this folding: the folding emerges by self-organization. A mutation, likewise, does not code for a new form but only *enables* a new path for self-organization. [↑](#endnote-ref-4)
5. Though spontaneous, self-organization is constrained and therefore not random. It repeatedly leads to predictable, optimal outcomes. Even the overall helical form of DNA is a pre-existing mathematical possibility for optimal form that, in the course of evolution, has been rediscovered repeatedly by self-organization. Another example of that optimal form is the frequent helical segments within the folded secondary structure of a protein and yet another is the frequent helical arrangement of leaves on a plant stem.

Recently, many other examples of convergent evolution (pre-existing possibility) have been identified until convergent evolution is now seen to be the rule in biology rather than the exception (McGhee 2011). In ancient oceans, for example, colonial polyps (primitive animals) evolved the branched fern-form to create an optimal surface for filter feeding on plankton. Much later, on dry land, plants rediscovered the fern-form, using its optimal surface to ‘filter feed’ on photons of light. In black-and-white photos, a fossil of the ancient colonial polyp looks identical to a modern fern leaf (McGhee 2019).

It follows by extension that such pre-existing, optimal, mathematical possibilities must also play a major role in *psychological* self-organization. Author (2001) argued that Jung saw evidence of pre-existing optimal possibilities but could not fully explain them because he had neither our current understanding of evolution nor the theory of self-organization in complex adaptive systems. Jung called such possibilities *archetypes* and showed that each mythological god represents an archetype. A large part of Jung’s work was to explore how archetypes support psychological development. Since the myth of devouring Saturn is the subject of our paper, all of the above is relevant: the myth depicts the negative aspect of the archetype of the father. It is beyond our scope here to more fully explain an archetype in terms of dynamic systems but, for this, the reader is referred to the earlier paper by Author (2001). [↑](#endnote-ref-5)