EMERGENCE:
NATURE'S MODE OF CREATIVITY

Institute on Religion in an Age of Science

The Fifty-third Annual Star Island Conference
Saturday, July 29, to Saturday, August 5, 2006

A Self Organized[1] IRAS Chronicle

bob mccue
Written between August 5 and October 2, 2006
Photography by Dallin McCue
http://mccue.cc/bob/spirituality.htm

[1] See http://www.calresco.org/sos/sosfaq.htm for general information about self organizing systems.

Table of Contents

EMERGENCE:
NATURE'S MODE OF CREATIVITY

Institute on Religion in an Age of Science

The Fifty-third Annual Star Island Conference
Saturday, July 29, to Saturday, August 5, 2006

A Self Organized[2] IRAS Chronicle

bob mccue
Written between August 5 and October 2, 2006
Photography by Dallin McCue
http://mccue.cc/bob/spirituality.htm

"I believe that imagination is stronger than knowledge - myth is more potent than history - dreams are more powerful than facts - hope always triumphs over experience - laughter is the cure for grief - love is stronger than death." Robert Fulghum

"The foundation of morality should not be made dependent on myth nor tied to any authority lest doubt about the myth or about the legitimacy of the authority imperil the foundation of sound judgment and action." Albert Einstein

[2] See http://www.calresco.org/sos/sosfaq.htm for general information about self organizing systems.

Introduction

My limited ability to capture qualia fades quickly after the experienced moment. So having been asked to write a brief conference report just before leaving Star Island on the "first boat", August 5, 2006, I sip an edge blurring, left brain loosening[3] plastic cup of wine while putting fingers to keyboard aboard United Airlines flight 1131 from Chicago to Calgary. A nap from Boston to Chicago, the first leg of our 16 hour trip home, rejuvenated me, and I am thankful for having been asked to do this. I will likely look back on preparing for and attending this conference as one of life's intellectual watersheds. Writing a report will help me to synthesize what I have learned, and at this point I feel the need for a great deal of synthesis. I have been immersed in deep, rich waters for a week, and my head still swims with exciting ideas that are only loosely cobbled together. When I am finished with the analysis I feel inclined to do for my own purposes (that is, what follows) I will condense that into the kind of piece Ted Laurenson had in mind when he asked to prepare a report that will appear in the Fall 2006 IRAS Newletter, and will eventually be posted at www.iras.org.

So, what follows is an IRAS Star Island 2006 stream of consciousness. Most of the speakers provided summaries of their presentations[4] and better yet, thanks to Don Braxton[5] we have the plenary lectures available by podcast[6], and eventually the morning chapel services will be added. So instead of attempting an ordered overview of what happened I will open the mental flood gates while reviewing my notes, and trust that the odd meaningful eddy will emerge from that turbulent flow. In keeping with the conference theme, this report will no doubt flirt with order and chaos, theory and metaphor, perception and reality, and who knows how many other dualisms. Such is life.

Once finished, I will add paragraph headings and a table of contents that will make this rambling report easier to use. For example, some may not find the important-to-me teenage aspect of IRAS on Star Island interesting and may benefit from skipping that section, as well as others.

After re-reading what I initially wrote below, I decided that in order to make this report intelligible for non-IRASians and IRASians who are not up to speed with regard to the technical language of complex systems theory and emergence, I should add links to Internet sources that define technical terms that I can't define if I want to move quickly enough to capture the edge-of-chaos[7] essence of the IRAS/Star Island experience.

I have also added an appendix, largely taken from the notes that I made in preparation for the conference workshop I presented this year, that reduce a big piece of complexity theory's guts to the discussion of a few diagrams. The appendix then continues as a discussion of some interesting social science applications for complexity theory.

---

[3] My limited artistic training has included the admonition from painting, drawing and writing instructors to "squint" (literally and figuratively) at my subject to gain the perspective necessary to use art to represent truth by distorting reality. Squinting is a quick and dirty way to "blur the edges" in the way both provocative and evocative art often does.

[4] See http://www.iras.org/conferences/book2006_nomap.pdf for the conference booklet.

[5] See http://faculty.juniata.edu/bio.html?BRAXTON.

[6] See http://web.mac.com/donaldmbraxton/iWeb/Podcasting%20pages/Braxton%20Podcasts/Archive.html

[7] See http://www.calresco.org/sos/sosfaq.htm#3.3, and http://www.edge.org/3rd_culture/kauffman03/kauffman_index.html.

I should note that I am a Star Island neophyte. This is the second year my family has been there[8], courtesy of a chance encounter with Ursula Goodenough (IRAS' prophet, priestess and chief salesperson[9]) at a brain and consciousness conference at Cal Tech, just over a year ago. She is one of IRAS' important seed crystals[10], and one of the sources of the healthy, recursive pattern that characterizes this IRAS generation, as well as IRAS as far back as I can see it through the memories of its most seasoned members. Ursula was honored at our closing banquet this year with a long overdue IRAS service award. The crowd's demand for a speech was met with a characteristic "Thanks guys" or "Gee, thanks", I can't recall which. Ursula is a butterfly's wing[11] in my life and many others, for which I am pleased to publicly thank and honor her.

So, I am on IRAS' cusp if not still an IRAS outsider, and this means that what is important to me and hence what I observe may be different from some of the old hands. Please forgive me if I step on any toes in what I am about to say. I proceed on the assumption, justified by my IRAS experience so far, that I am speaking to my family who welcome me in spite of, or even because of, my idiosyncrasies.

The Trip Home

Since I am on my way home as I write this, I straddle the post-IRAS traveler's twin peaks – intellectual satiation (and need for digestion) and sleep-dep induced exhaustion. How these two combine two depends mostly on what you did the last night "on Star"[12].

You might be one of the teenaged IRASians who pulled an(other) all-nighter while enjoying one last long round of laughing and talking while laying on the ground, wrapped in blankets, star gazing with your new friends. If so, you were with Dallin (age 16) and Teresa (age 14) who travel home with me. Or you might be one of the IRAS faithful who into the wee hours performed the essential social function of liquidating excess Happy Hour inventories (why didn't someone come get me for that? …).

So for some, exhaustion over-whelms during the trip home while for responsible others like me (why DIDN'T someone at least TELL me about the Super Happy Hour last night …?), satiation and the need to digest dominate after a snooze.

So here goes some real time digestion.

Star Island Teenage Emergence





[8] See http://mccue.cc/bob/documents/rs.star%20island%20overview.pdf for some information related to our experience last year.
[9] Yes Ursula, I purposefully mixed those genders.
[10] See http://en.wikipedia.org/wiki/Seed_crystal.
[11] See http://en.wikipedia.org/wiki/Butterfly_effect.
[12] I love that unconscious, fecund metaphor.

I am not sure what I enjoy most about coming to IRAS's Star Island – its intellectual cornucopia or the sight of my children's blossoming encounter with a rare combination of diverse friends and a welcoming, consciousness-stimulating environment that calls new qualities out of them. This is emergence – Ursula and Terry's "something more from nothing but"; life's shimmering, almost understandable, miracle. And the bonds it produces are a source of fascination and joy for me.

As our teenaged children came out of their stupor during the last leg of our trip home – from airport to house – I asked them about their Star Island experience, what they liked and didn't like, etc. We talked about the wonderful way in which their group coalesced again this year. I had thought that perhaps last year's great experience was a fluke, and had worried a little that this year might be a let down. But during the first day on the island my concerns dissolved. Each of kids was off and running. So during the last half hour of our trip, we talked about how they might stay in better touch with their Star Island friends this year, and how if they earned some money I might help to finance a trip or two[13] so that face-to-face contact[14] could occur.

That got Dallin excited. "Dad", he said, "I couldn't believe what it felt like when we got on that boat this morning. It was like something was being torn out of my chest. It physically hurt. It felt wrong!, like I was being taken away from my family!" Teresa empathetically echoed his sentiments.

While teenage romantic attraction may have a small role to play in their feelings, I know enough about what they did on the island and their other friendships to be sure that attachment to their Star Island group of friends was primarily responsible for what they told me. But there was another hypothesis I thought worth exploring.

"But", I said, "you were all up all night last night. You were just exhausted this morning." They proceeded to convince me that while they were tired, their feelings changed when they got on the boat and had to watch half of their friends standing on the dock, waving goodbye, as they sailed away. Those on the boat went straight into mourning and hardly spoke for the rest of the trip. Goodbyes on the Rye side were muted. Exhaustion likely supercharged what would have been in any event a powerful emotional experience.

Some people avoid intimate relationships because they can't stand the pain that separation of different kinds causes. This is a choice that makes sense for some given their life's experience. While it is not fair to equate this to closing one's eyes to a miraculous sunset because it is so disappointing when it fades, these experiences are in a sense similar.

So we talked for the rest of the trip about the privilege it is to feel so deeply about other human beings, and particularly after such a short time together. What was it about IRAS on Star Island that did that? "It was how friendly, interesting and accepting the kids were", they said.

"Did the people who organized the programs for you have anything to do with it?", I wondered. That was a new thought for them, which means that context had played its usual near invisible role in creating human experience. As our discussion continued, they told me a number of things about the activities in which they engaged that indicated they were encouraged toward openness, trust and accepting, ethical behavior.

[13] As I conclude this on October 2, at least one trip has been planned.
[14] That might have been a Freudian slip that I won't correct now that I have spotted it.

Asher Woodruff played an unusual, and oddly important, role in this. He was their peer and leader – the older, cool, former renegade who was still crazy but not as dangerous (I am told) as he was as a teenager – a better balance in what has always been (again, I am told) a powerful mixture of order and chaos.

This year Asher was a "Pel"[15], but went out of his way to interact with the younger kids who were in his group last year. His stories of the meltdowns and out-of-bounds behavior that caused trouble for his peer group a few years ago had a healthy restraining effect on those who looked up to him this year. Thanks Asher. If you need some Canadian tax advice (or anything else I can help with), you have at least one free pass with me.

And wonderful, talented adults like Jennifer Witten[16] at times stayed up until 2 am playing games with the kids, and whether she knew it or not, modeled in a powerfully influential way, healthy young adult social behavior.

How many places are there where people like Juli and me would be prepared to suspend our usual curfew rules, allowing the freedom necessary for our kids to experiment with new behaviors in a context where a number of other nice kids are similarly empowered while near ideal social behavior is modeled by adults talented enough to cause a social phase transition[17] in a group of teenagers? This is rare earth indeed.

IRAS on Star Island this year and last provided a fine combination of physical and social factors as far as this teenage bunch is concerned. For this I thank all involved – parents for trusting their kids; Island staff for creating the right macro space; and most particularly, Sandra Woodruff and the other adults who ran these fine programs.

Star Island and Emergence in General

[15] The Pelicans are the young adults who provide the labor that makes Star Island function, and are often kids who attended various Star Island conferences with their families while growing up and hence have a special connection to the place and its social institutions.
[16] Jennifer was in charge of some of the kids' programs this year.
[17] See http://www.calresco.org/sos/sosfaq.htm#3.4.

I went into the teenage social emergence phenomenon in some detail in part because I found it particularly interesting, but also because I think it illustrates a larger Star Island/IRAS dynamic.

I could tell stories about how IRAS on Star Island and elsewhere has been a powerful influence on me; about the role it has played in the life of our 25 year old daughter Amanda and her four year old son Ayden for two summers now (one of Ayden's last words before he passed out near the end of our trip were, "I am going back to Star Island next weekend!"); about how this year's Star experience affected our recently (as in the past few weeks) post-Mormon[18] 23-year-old son and our "what-am-I-going-to-do-with-my-life?" 20 year old daughter.

IRAS on Star Island performs an unusual catalytic[19] role in the process of human becoming. It is a powerful attractor basin[20] from which many new adjacent possibles[21] open up. Star Island helps us to change stagnant or dysfunctional patterns, thus leavening life. It jars us out of the comfortable into the creative edge of chaos[22] that plays a crucial role in the maintenance of living and social systems, poised as it is between the more and less ordered as indicated by the "complex" space in the graphic below.

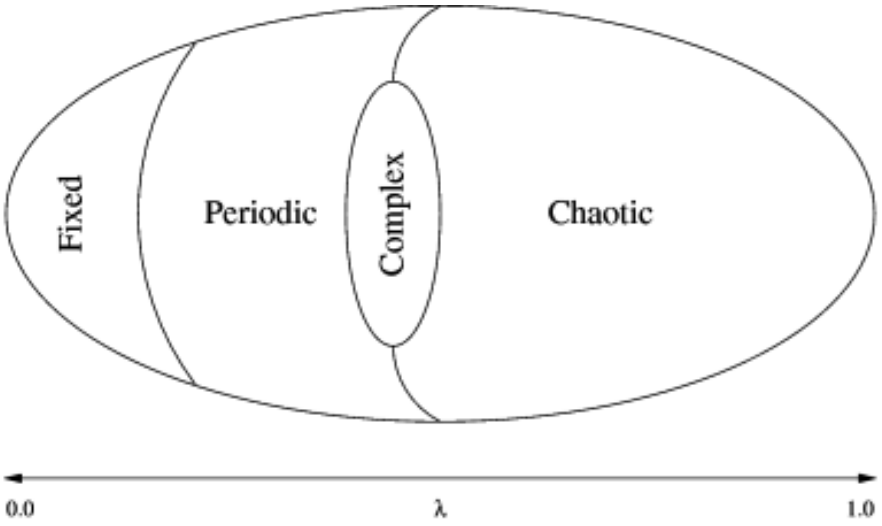


Figure 15.9 Langton's schematic representation of CA rule space characterized by the λ parameter

[18] A person who was at one time a fully participating Mormon and for ideological reasons has withdrawn from association with the Mormon institution. I like to think of this as a kind of "graduation".
[19] See http://en.wikipedia.org/wiki/Catalysis.
[20] See http://www.calresco.org/sos/sosfaq.htm#2.8.
[21] States that are reachable within some definition of that term from a given state. For example, becoming a dinosaur is not an adjacent possible for a white moth in biological evolutionary terms. But becoming a dark moth is. See Stuart Kauffman's talk on this and related topics at http://www.edge.org/3rd_culture/kauffman03/kauffman_index.html.
[22] See http://www.calresco.org/sos/sosfaq.htm#3.3.

Star Island is like one of those renewing bursts of new ideas, and confusion, that characterizes the democratic electoral process, and from which many of our important social innovations evolve[23]. Star Island lets us feel our worldview's inadequacies, and provides much of the equipment and encouragement required needed to pry it open it. It helps to create a personal Axial Age[24]:

One of the reasons that I have taken so quickly to the edge of chaos aspect of complexity theory is that it neatly explains my favorite branch of mythology – the restructuring of the self and by extension society, that occurs during the hero's great adventure.

Joseph Campbell[25] and other students of comparative mythology have explored the ancient theme of the adventuring hero who descends into and is restructured by chaos in the form of the dark forest (the Authurian legends); the underworld of Greek, Egyptian and other mythologies; the belly of the beast (Jonah, Hercules and other heroes); etc. and then returns to perform a catalytic role in his society. Complexity theory explains why this theme recurs – it is essential to continued human vitality and survival.

The step into chaos disrupts life, produces fear and pain and leads to creative re-ordering. It takes experiencing the birth canal that leads to a radically new worldview, and the exhilaration that follows, to understand how much we depend upon ideas for survival.

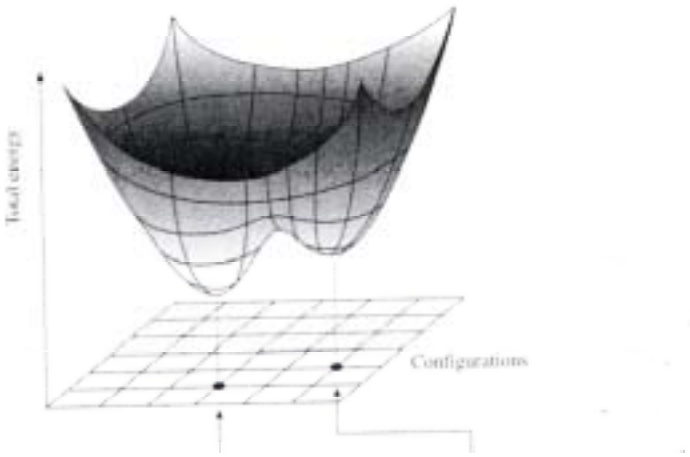
I have experienced both painful chaos and exhilarating renewal at Star and in the IRAS community. For teenagers swimming in the primordial, chaotic soup from which adult humans have always crawled, I can't imagine a better place for foundational patterning – the creation of personal and social warp and woof[26] – to occur.

In short, we experienced at Star Island a week of learning about emergence while emerging from ourselves, and I am still in a state of wonder at how my thinking as been restructured and made more powerful as a result of this experience and the reading I did to prime my pump for it.

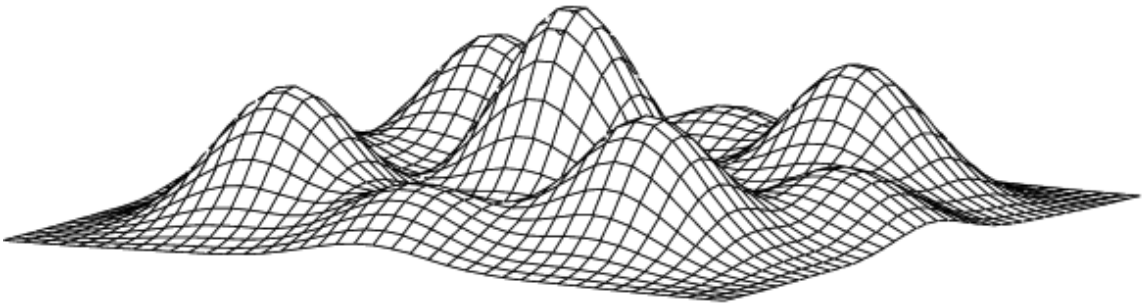
Adaptive Walks into the Adjacent Possible

One of my most important take home points this year was how we use an "adaptive walk"[27] from "attractor basin" to "adjacent possible" attractor basin at the "edge of chaos" as our environment (or perception of it) changes. Imagine the attractor basins as the valleys between the peaks in the diagram below that hold marbles, with particularly deep ideological attractor basins looking something like this:

[23] This is part of democracies genius – it institutionalizes period dips into controlled chaos.
[24] See http://en.wikipedia.org/wiki/Axial_Age.
[25] See http://en.wikipedia.org/wiki/Joseph_Campbell.
[26] See http://en.wikipedia.org/wiki/Weft.
[27] See http://www.calresco.org/sos/sosfaq.htm#4.4.



Further, imagine the adaptive walk as what occurs as peaks and valleys move up and down causing marbles to roll out of valleys as they disappear, and into adjacent basins; and the adjacent possibles as the valleys into which the marbles have some chance to roll if an attractor basin collapses.



These ideas enable to me make sense of many aspects of life I have wondered about, including my own experience that includes evolving first from literalist Mormon[28] to quasi-literalist Christian, largely on the basis that I felt Intelligent Design (ID) made sense (I knew virtually no science a few years ago). I doubt that I could have let my Mormon beliefs go without the perception that ID shored up some kind of vague God concept.

Having moved from the Mormon attractor basin as it collapsed to a basin defined by Christianity and ID, a new set of adjacent possible attractors opened up for me, and so as ID collapsed as I learned more about science, I was able to step from one attractor basin to another. None other than the first of these moves would likely have been possible from my position as a lapsing Mormon. For example, during my first year or two out of Mormonism, I would have found Ursula's rendering of the sacred in "The Sacred Depths of Nature" too challenging to take seriously.

[28] See http://mccue.cc/bob/spirituality.htm.

Based on my personal experience and reading a number of books related to psychology and neuroscience[29], it seems reasonable to hypothesize that our unconscious mind is aware of many more problems with our worldview than is our conscious mind; that the unconscious suppresses a great deal of information that the conscious mind would likely have difficulty coping with in a way that the unconscious (and relatively primitive) mind considers adaptive; and that this information is released into the conscious mind only after the unconscious has worked out a way to cope with it or the costs (as perceived by the primitive unconscious mind) of withholding it are likely higher than the chaos that releasing it will create. Or as Anais Nin put it,

> "And the day came when the risk it took to remain tight inside the bud was more painful than the risk it took to blossom."

It would not surprise me to find that the unconscious mind guides that adaptive walk described above in order to ease the relatively brittle conscious mind through difficult changes. That is, the unconscious puts the brakes on mental emergence so as to enable us to grow the necessarily neural and social equipment to cope. As noted below, denial is in a sense adaptive.

These evolutionary steps at the personal level are closely analogous to the adaptive walk biological organisms make as evolution changes them. I believe that the same kind of analysis holds for social organisms, like religious institutions.

Thinking in terms of the "adjacent possible" is critically important for those of us who hope to encourage constructive social change.

Folders and Bridge Builders

I see people like Gordon Kaufman as important adjacent possibles for many who are as I was – on the outer edges of literalist religious traditions, looking fearfully into the what often appear to be nihilistic borderlands. Gordon, Phil Hefner, Karl Peters, Ursula Goodenough, Brian Swimme, Rabbi Lerner, Bishop Spong, Arthur Peacocke and many others help to build bridges of various types between ideological systems. I heard Stu Kauffman indicate that he is planning to write a book entitled "Reinventing the Sacred", thus throwing his hat into the bridge builder ring. That encouraged me. We can't have too many talented bridge builders. Stu's proven talent for conceptualizing slippery phenomena could build big bridges.

Even people with whom I violently disagree, like William Dembski[30], are inadvertent bridge builders and hence constructive in some ways. Phil Hefner introduced me to Tielhard[31] – another thinker of this type whom I have found particularly interesting. For reasons I am about

---

[29] I found the following particularly useful, in no particular order: Pascal Boyer, "Religion Explained"; Loyal Rue, "Religion is Not About God"; Scott Atran, "In Gods We Trust"; Jon Haidt, "The Happiness Hypothesis" (you can find some sample chapters at http://www.happinesshypothesis.com/); Martin Seligman, "Authentic Happiness" (see http://www.authentichappiness.com for a wealth of interesting material); Mihaly Csikszentmihalyi: "Flow : The Psychology of Optimal Experience"; "The Evolving Self : A Psychology for the Third Millennium"; "Changing the World : A Framework for the Study of Creativity"; Creativity : Flow and the Psychology of Discovery and Invention"; (see http://www.innovation.cc/book-reviews/cz.htm); John Ratey, "Shadow Syndromes" (see http://findarticles.com/p/articles/mi_m1175/is_n3_v30/ai_19371115 for an overview); Steven Pinker, "How the Mind Works" and The Blank Slate"; Quartz and Sejnowski, "Liars, Lovers and Heroes".

[30] See http://en.wikipedia.org/wiki/Intelligent_design.

[31] See http://en.wikipedia.org/wiki/Teilhard and http://www.stnews.org/Commentary-2058.htm.

to clarify, I refer to Teilhard and the others just noted above as "folders" as well as bridge builders.

Teilhard was a scientist, Jesuit priest and mystic who lived from the late 1880s to mid-1900s. He resonates mostly with me as a poet – a describer of the indescribable.

Teilhard was one of those who by dint of his training, personality and intelligence entered the zone of relative chaos between cultural attractor basins. He was a Jesuit and scientist in an age when science was taking over. He stretched his Catholic commitments in order to make them resonate with his scientific beliefs. This created a Baroque worldview; the kind that can only be conveyed through poetry and creates rich fonts of potential meaning through metaphoric as well as literal means. I don't know enough about Teilhard to know which he intended. But that doesn't matter much. Once a text is created, it takes on a life of its own[32].

Teilhard's personal story – and particularly the conflict he must have experienced as he tried to synthesize the two worlds in which he lived – reminded me of Steve Farmer's works regarding complexity theory and the dating of ancient documents[33]. His theory is that as cultures form, and then overlap, develop new technologies, etc. and synthesize each of these changes with what preceded them, a pattern that bears the signature of complex systems emerges because each change is constrained in some ways by prior changes and their effects in a fashion that mimics biological evolution.

Think of a simple origami shape that is subsequently folded in different ways, and occassionally augmented by already folded new sheets of paper that must be joined to it by overlapping folds. The more time passes, the more elaborate these shapes will become. Steve believes that enough of this cultural process is captured in the religious writings of early civilizations that by measuring the complexity (linguistic and conceptual) in these documents, they can be roughly dated. He has developed a complexity theory based computer model that does this.

A similar analysis can be applied to architecture, fashion and various other human endeavors. Cities like Nime, Arles and Cordoba fascinate me for this reason. They display so much history – so many folds – in one place.

Teilhard was a folder. His scientific beliefs and the primacy he afforded them in at least some ways, forced him to the edge of Catholic theology. From there he folded in many directions to create a stunning pattern of ideas that still function as bridges between the religious and scientific worlds. Brian Swimme, for example, is sometimes referred to as a Teilhardian.

Teilhard's work likely changed the Catholic attractor basis and perhaps the religious attractor basin. The fact that I had not heard of him is only evidence that Mormons don't find his ideas useful. Mormonism is still a young, and hence simple, religion. Teilhard's elaborate kind of folding is only now getting nicely started in Mormonism.

Thinking of Teilhard reminded me of the recent comment on the IRASRN listserve regarding the "Chief Exorcist" of the Catholic Church in Rome. Catholicism's long history makes possible such a office today, and it would not be surprising to find it staffed by a credentialed scientist while ignored by the vast majority of Catholics. This is precisely the kind of thing Farmer is

[32] See Prothero, "American Jesus: How the Son of God Became a National Icon" for example.
[33] See http://www.safarmer.com/simulations.pdf#search=%22%22steve%20farmer%22%20complexity%20theory%22.

getting at. The more history, the greater organizational, conceptual and linguistic complexity and variety a given organization will tend to house.

IRAS is a organization that houses a disproportionate number of folders and bridge builders. Its cultural ethos encourages this activity. It's leaders model it. That is a large part of what attracted me to it.

Star Island's Environment and Rhythm

As a result of the diverse crowd at IRAS' Star Island, many conferences are wrapped into one and while resonating with each other, they present a wide range of experience.

The children's and teenage groups create their own worlds, and there are various adult worlds as well. Without trying to describe them, I will note a few of the main niches in the Star environment and let you imagine the kinds of humans that would flourish in them.

At about 6 am most people are still asleep, but if you go down to the Oceanic's broad porch you will find the morning crowd astir. Some organized activities commence at that hour, such as bird walks. But many like this quiet, beautiful time for themselves and enjoy it sitting in the gazebo overlooking the bay, on the rocks or in a rocking chair while reading, meditating or day dreaming over a fresh cup of coffee. Others launch straight into conversation.

Yoga starts daily at 6:30 (and "centered prayer" begins shortly thereafter if that is your preference) and at the same time the conversation on the porch intensifies. The polar bear swimmers (young and old) hit the 60 degree (on average) water at 7 am, invariably amidst a laughing, teasing and the occasional scream. At the same time, people can be seen all over the island jogging, doing calisthenics of various kinds, walking and chatting.

I was stunned last year, by the way, when my then eleven year old son Kieran informed me that he wanted to go polar bearing and asked that I make sure to get him up the next morning. This was far out of character – an emergent behavior called into being by the Star Island environment – and so with some interest I got him up the next morning and went down to the dock for the first of what became a near-daily ritual dip in the Atlantic. A few of his friends were there. They had persuaded him that this was going to be a huge amount of fun. And so it was.

Some of my best discussions occurred while floating half numb in that water. This year, for example, Lyman Page explained to me the ethics of suicide and how hypothermia might be "the way to go when one is ready to go", based both on the science related to this topic and his personal experience while trying to free an anchor from the bottom of a river some time ago. Medical people have a wonderfully detached way of dealing with deeply personal issues. I can't recall how we got onto the topic of hypothermia while in that water …

During another discussion, a Star veteran whom I can't now recall told me that she overheard the Pels talking about how different the IRAS crew is among the Star Island conferences. One of the Pels mentioned that even while polar bearing the IRAS people tended to form conversation nodes, bobbing up and down in the ocean, and talk about the most "bizarre" stuff. "Those people don't know how to turn it off", was the Pel's concluding comment. This anecdote was recounted at the tail end of a pleasant conversation about neurology as it relates to complexity theory while floating just off the Star Island dock.

Many of us who come to IRAS Star Island don't have many other chances to interact with people who are knowledgeable about topics that are of intense interest to us, and so we tend to be hyper-aware, hyper-communicative (hyper-alive?) while on Star. The intensity and excitement around this experience is what makes Star so enjoyable for many of its participants, and this creates energy others feel.

For example, while at Star I almost invariably wake up each morning with new, high quality (from my rural point of view, at least) ideas spinning through my head and immediately jot them down since I have learned through hard experience that flashes of possible inspiration that are not recorded often do not survive to be winnowed into something useful. My wife noted that she became accustomed to waking each morning on Star Island to the sound of my computer keyboard clicking before I headed off to polar bear.

Breakfast creates one of three daily bread breaking sessions that are used to renew or create friendships, continue discussions related to seminar or conference topics, find one's family, etc. At Star Island as elsewhere, special bonds are created while sharing sustenance. The only problem with the food at Star is that it tends to go down too easy during wonderful conversation. I consume roughly three times my usual dietary complement while there.

While at breakfast, the "Star Beacon" is delivered to outline the day's activities and provide highlights from the day before, sneak pre-views of what is to come, and an assortment of original artwork, cartoons, poetry, limericks, haiku, short essays, educational quizzes, and miscellanea. A few editorial pieces were published this year that questioned the direction IRAS seems to be taking given the largely scientific (secular, that is) orientation of the conference. Thus, the Beacon is part of IRAS democratic infrastructure, allowing grassroots communication about issues of fundamental concern to IRASians. Given its publication deadlines, volunteer staff[34] and ad hoc editorial policies, this is a remarkable 6 to ten page daily publication.

Each meal is also spiced with a news bulletin that tends to be equal parts important, sublime and mundane. We heard about scheduling corrections, play by play accounts of absent IRAS faithful who were battling life and death health problems, pleas for help to find lost notebooks or shoes, and everything in between.

After breakfast the chapel service would commence. George Fisher and Gretchen van Utt conducted these on a tag team basis, handing the microphone back and forth paragraph by paragraph as they went. Each morning they masterfully wove science and traditional religious beliefs into a science based mythology, producing a chord that echoed throughout each day. I looked forward to lounging in the morning sun on the rocks outside the chapel as I listened to their wisdom while feeling their energy. I could not help thinking over and over again, as I did so often while interacting with people on Star Island, "These are good, wise people – the kind I want to spend as much of my life with as possible."

Then on to the day's cornucopia of plenary sessions, workshops and porch conversation. The plenary sessions were spectacular. Starting with Loyal Rue's incisive, funny opening address (which began with his pretension to know nothing about emergence theory and that he was only invited to speak to re-commit him to IRAS) and ending with the wrap-up session summarized below, these were by and large outstanding, if technically daunting in some cases.

[34] The talented Jane Bengtson and Andrew Millard were in charge this year.

During the day between conference sessions, a huge variety of different workshops ran. These addressed topics/activities as diverse as drawing, poetry, and the serious consideration a host of scientific and cultural issues, including what makes things funny. And in the meantime, parents with small children tended to drift back and forth between the adult and children's activities; some people made use of the tennis courts and basketball hoop; games of baseball, Frisbee etc. broke out on the lawn; innumerable kites and balsam airplanes were flown (and broken); plenty of suntans were improved, naps were taken and books read; and the odd romance blossomed (though I have been told that Star seems designed to make this difficult).

Various interest groups gathered around things like practising for the choir's performances, which this year were spectacular. My son Brayden participated, and loved that aspect of his first Star experience. From his choir seat in the chapel, he watched as several people (including at least one of the conference's plenary speakers) were moved to tears. There is something about the chapel that is magical in this regard. I felt that place deeply last year and again this. For well over two centuries it has echoed human experience: hymns sung at candlelight during storms while praying families hoped their fisherman back from the violent sea; laughter, love and high hope at weddings; tears and remembrances at funerals; political rallies; erudite of scientific discourse; most humble expressions of faith; countless forms of well intended ignorance as well as wisdom.

Our experience – the razor thin conscious moment – skims across history's crest like sea birds riding the wind just above waves as they race toward shore. Our consciousness; our biology; our history; our cultural – we are froth on each of these churning surfaces, and countless others. We fear awareness of these vast domains from which we have emerged[35], while being at the same time impelled by our dawning consciousness to search for the secrets that have made humankind one of this planet's most adaptable and powerful organisms.

Star Island's chapel brings us unusually cheek to jowl with our depths and so opens us. This helps us to continue lurching between certainty, confusion, epiphany and wonder as humankind always has. Those few who incline toward awareness of this kind have disproportionately catalyzed creativity, as Pareto[36] hypothesized would be the case. We feel this happening on Star.

As the day continues, groups (young and older) prepare for the art and talent shows toward the end of the week. When faced with the opportunity to perform, and then necessity once the commitment is made, all kinds of energy summons itself and working relationships form as talents combine. This creativity advanced day by day throughout the week, and showed itself off at the end in a few skilful performances (Chip Ordman's hilariously wry poetry at the adult show comes to mind) and others that entertained in different ways. Many displayed nascent creative gifts since they felt safe enough in a community of relative strangers to do so. This, in my view, is more remarkable than the kind of artistic talent that can be found in any diverse group.

Several different kinds of worship service from the Jewish and Christian traditions were conducted, are well as analyzed, throughout the week – another rare, rich opportunity.

[35] Or, to use Loyal's nice metaphor, the fact that we are composed of "grunge" disturbs us. We don't want to admit it that we are just plain old matter, without the magic of a "spirit" or "soul" of some kind. Complexity theory helps us to see amazing creative power, if not magic, in grunge.
[36] See http://en.wikipedia.org/wiki/Vilfredo_Pareto.

Lunch and dinner passed each day much as did breakfast. Evening commenced with happy hour – a pre-dinner social lubricant. This involved a lot of good conversation over a drink or two, with optional gospel and other sing alongs to various musical instruments. Late evening dancing, movie watching and various musical recitals and discussion groups concluded each day.

Sunsets at Star Island are at times spectacular.






The evening lecture regrettably does not finish in time to show case these, which means that if a nice sunset is underway during the mid-lecture break, conferees often linger on the porches while it fades.

This year nature treated us to another of her marvellous displays in the form of a squall that tore the island apart for about an hour one afternoon. This topped the old basketball hoop (interrupting Michael Cavanaugh's weeklong experiment related to the physics of basketball shooting – watch Sports Illustrated for more on this front) and sent furniture cart wheeling across the lawn.

The evening highlight for me each day was the candlelight service at the chapel. I love its combination of ritual and creativity – a classic edge of chaos display. The walk up the hill in silence, carrying fragile light; awareness of stars that would come into view as this light disappeared into the chapel's sacred space; awkwardness as lanterns were hung and people rustled into their seats; the variety of personal (soaring, introspective or both) chapel service offerings; the challenge of singing unfamiliar hymns; the lightness of being that accompanied each such experience; the silent and slightly euphoric walk back to the Oceanic porches' relative profanity where the chapel could be immediately savored with others. Wonderful.

Frank Thoms summed up much of what I felt about Star Island this year in his chapel service:

> "It is only Monday evening and already we have emerged to new places in our minds and our hearts. We are coming to grasp meaning and sense the creative process of the universe. We are looking for words, yes, but more so perhaps we are seeking connection to the meaning of it all, of which words are only a part. We are here on Star because we want to move closer to the essence, to the center, to knowing, to understanding, to being. We sit in this chapel in the mornings with George and Gretchen and in the evenings with each other to find that something else, the unknown that is within, the mystery that surrounds, the essence that is … and is becoming …"

The musical recitals are worthy of particular mention. These were provided by Thomas Goodenough Heuser and Lauren Avery, who attended the conference as Sturges Fellows. Jessica Goodenough Heuser, Hillary Early, and Jason Keune performed with them. Most of these young people are studying voice and instrumental music at the university graduate level. The opportunity to experience professional quality chamber concerts in the chapel – with all it brings to the occasion – on a daily basis was great. This experience was significantly enhanced

for me by the chance to get to know the musicians. Just as knowing the poet changes the poetry, so does knowing the musician bring nuance to her music.

Running the length and breadth of each IRAS conference, as well as the Oceanic itself, are the porches. Within minutes of arrival I was in my first conversation group at the top of the Oceanic's steps. Shortly thereafter I was seated in one of my favorite rocking chairs looking out at the boats bobbing at anchor and chatting with friends I had looked forward to seeing for an entire year.

A wide variety of different expertise and opinion can be found on those porches. Groups tend to form on the basis of the usual social attractor basin factors – expertise; degrees of similarity; the location of adjacent possible attractor basins; etc.

Walking out onto the porch after a presentation is like going into the market – vegetable vendors on one side; clothing on another; arts and crafts on a third; etc. We can supply ourselves as we as are accustomed or can experiment with many exotic wares.

In this regard, IRAS on Star is a microcosm of human society. We are mimetic[37] creatures, and once we have acquired patterns that have been engrained in our neural circuitry we resist contrary patterns. But if we closely associate with others who display patterns different from our own, we will tend to adopt their patterns surprisingly quickly[38], and often explain this unexpected and historically unusual (our ancestors did not change basic social groups very often) change of behaviour to ourselves in similarly unusual fashion[39].

Relatively chaotic intellectual space exists between some of the attractor basins represented by discussion groups on the Oceanic's porches, and at times (as in Gary Hoelzer's traffic thought experiment described below) ideological collisions occur there. Most of these are conducted politely, but while the tension is sometimes evident …

[37] See http://en.wikipedia.org/wiki/Mimetic.

[38] See http://mason.gmu.edu/~mmakowsk/AccidentalAtheist.pdf#search=%22iannaccone%20%22agent%20based%20simulation%22%22

[39] The experience of spiritual epiphany is sometimes a rationalization for what has been experienced (something amazing must have happened because my behavior has changed so radically), much as is the perception of being "hot" while shooting on the basketball court or rolling dice in the casino.

it virtually always remains under control.

"You want proof? I'll give you proof!"

That is, we never saw one of these.

One measure of love is the amount of energy that will be invested to maintain relationships across these chaotic gulfs. And the relationships that have flourished in the long term within these relatively narrow constraints are beautiful – like wind and ocean spray blasted jack pines rooted in deep, rich soil. This, for me, is central to what makes IRAS worth pouring my time and life's energy into. It is a real time social experiment that is relevant to some of humanity's most important current questions.

IRAS on Star's main problem is that it offers too much. It is many conferences. One can't possibly attend them all. I say that in jest of course. Life also offers too much. We must choose. And the choices on Star this year were tough to make.

For example, I have been corresponding with Carl Smith and Jerry Stone through the IRAS listserve for over a year and looked forward to meeting both of them. In the flurry of experience at Star, however, not only did I fail to interact with them, I did not even know they were there until after I arrived home.

What a rush.

Communal Openness, Tolerance and Consciousness

Upon arriving at Star last Saturday two of the first people I met were Stu Kauffman[40] and his wife Liz. They are also from Calgary and we had tried, and failed, to meet there some weeks earlier. While chatting with them, Terry Deacon[41] entered our group and within moments our discussion passed through a phase transition[42] and he and Stu were talking about what "information" is[43] per Shannon, Bolzmann etc. I thought I knew what information was, and had no idea what Terry and Stu were talking about. I decided that I would have to revisit this fundamentally important, and slippery, concept. But more importantly, it was clear that Terry and Stu – both among the leaders in their fields – were exploring an important question and publicly admitting that they each had ideas the other had missed, and that they still had a ways to go in figuring this concept out. They were learning from each other on the fly as science took another of the endless steps it has taken during the past several centuries. It was wonderful on this occasion and many others while at Star Island to interact with people while they chipped away at the edges of human knowledge, and to at the same time get a sense for the personal goodness they bring to this task.

The creation of knowledge about our world that Terry and Stu so nicely illustrated has given us both our prosperity and the "emergency" Gordon Kaufman, Stu Kauffman and Loyal Rue would attempt to impress upon us. That is, it is probable that humanity's rapidly increasing power during the last century in particular has put us in a position where our domination has pruned Earth's ecological tree so radically that in spite of our best efforts, a severe pruning of the human tree will follow. I will return to this idea, and for ease of reference will refer to it as the "KKR Emergency". My apologies to Kolbert Kravis Roberts[44], also known as KKR. Our use of KKR in this context is more important than theirs, so I appropriate the acronym without apology or even a backward glance.

One of IRAS's many fascinating attributes is the way in which it has fostered a remarkable degree of diversity across so many vectors of human experience and belief, while maintaining conversation, acceptance and even love. Remember the talent show. Several adult participants (including my son Brayden, attending IRAS for the first time) presented far from polished presentations. This was more like a family reunion than a meeting of professional colleagues.

But IRAS openness goes well beyond familial politeness. This organization has maintained conversation across a contentious divide for over 60 years, and has developed an unusual group consciousness while doing so. That is, there is a direct correlation between openness to ideas that conflict with our own, how tolerant we are, and the kind of consciousness we have.

I heard Alan Watts[45] in one of his lectures on Zen Buddhism describe the state of "nirvana" – of being "extinguished" or better yet, "blown out" – as that in which the commonality of all existence is fully recognized. That is, I see myself in others and they in me. I feel their suffering as I do my own, since their suffering is my suffering and mine is theirs. In fact, I am them and they are me. Is this starting to sound like the mystery of the Godhead and Christ on the Cross? It should. Each culture wrestles with similar existential mysteries.

---

[40] See http://en.wikipedia.org/wiki/Stuart_Kauffman.
[41] See http://en.wikipedia.org/wiki/Terrence_Deacon.
[42] See http://www.calresco.org/sos/sosfaq.htm#3.4.
[43] See http://en.wikipedia.org/wiki/Information_entropy.
[44] A well known investment fund group.
[45] See http://en.wikipedia.org/wiki/Alan_Watts.

In any event, having more fully identified with humankind, I better tolerate flaws in myself as well as others. And why be arrogant over my accomplishments and jealous of what others do?

In some ways, IRAS is much further along the nirvanic path than most other organizations with which I interact. Sahdev Kumar is one of many who walk this talk. He is an emeritus professor of environmental studies at the University of Waterloo in Canada, and now teaches religious studies at the University of Toronto. His 14 year old daughter Ankita became friends with my kids and entertained us at the talent show with a brilliant synthesis of traditional Indian and modern dance. Sahdev is a first generation Canadian and is both highly sophisticated and traditional Indian. During a question and answer period after one of the sessions he said that Ankita told him matter of factly some time ago that she did not plan to marry an Indian man, and that she hoped her father would not be offended. In traditional Indian society a young person's decision like this could have explosive consequences. Sahdev described for us how he told Ankita that he supports her decision; that she is Canadian; that she should marry who she loves; that it did not matter whether he was Indian; that the combination of her culture with another would produce something new and good; and that he celebrated this.

I felt encouraged as I listened to Sahdev, and thought again of Ankita's marvellous fusion of Indian and modern dance.

And a Little Child Shall Lead Them[46]

The point of the KKR Emergency is that as human knowledge about our world has grown so has our power – our capacity to bend reality to our will, at least temporarily. And the problem is not our technology, it is the foolish way in which we use it. We need wisdom far more than power.

One way to address this imbalance concerns the trade off between consciousness and efficiency. For example, children are more conscious – more mentally chaotic – and less productive in some senses, than adults.[47]

Think of what happens when an adult goes to a new city – let's say Paris – and experiences a wide variety of new things while falling in love. Falling in love is an intense form of new

[46] See Isaiah 11:6.
[47] I owe most of what follows in this section to Allison Gopnik, a child psychologist at UC Berkley.

experience and creates a hormonal cascade[48] that can jar an adult human out of the relatively unconscious state in which we mostly live. This dips us into chaos and creates an opportunity for radical new growth as well as spectacular stupidity.

Most people who have experienced what Gopnik describes would agree with her – while in the state induced by new and interesting experiences the whole world seems to pulse with life while our brain is in a child-like learning mode.

Amusement park rides, and recently even restaurants, have used sensory enhancing or deprivation techniques to open consciousness. See for example http://gourmetfood.suite101.com/article.cfm/dining_in_darkness_reveals_joy where the latest, high end "dine in the dark" restaurant experience is described in part as follows:

> "Becoming fully aware the way a child is when everything is a new experience. This is a difficult state to achieve as an adult. Religious leaders, philosophers, poets and pushers have promised that elusive state and touted its rewards. The challenge of the undertaking is proven by the sheer number of solutions offered. We are overloaded with sensory stimuli. We become jaded. We cease to experience things in fresh ways. It's been my contention that achieving this breakthrough of fresh awareness is part of what drives iconoclastic Spanish chef Ferran Adria. I shared my impressions of his work and philosophies in my other blog, Bourdain Encounters Adria, Discovers More."

When deprived of our ability to navigate life using our adult auto-pilot equipment, we are forced to learn. The requirement that we learn changes our mental state, and makes us more likely to absorb and remember all kinds of things. The efficiency producing freeways in our brain are cracked open, exposing fertile soil in which new seeds will sprout. So at the edge of chaos, we become aware of textures, smells, sights and sounds by which we are constantly surrounded but generally speaking unconscious.

We are shocked into this state by confronting new stimuli that require us to use our faculties in ways we generally do not. While in this state, we feel more alive. Children live this way to a much greater extent than do adults. This causes their regular displays of wonder and excitement as they encounter novelty.

This helped me understand the way in which the world seemed to come to life for me during my transition out of Mormonism. I was, quite simply, jarred out of my "adult" mode into a child-like state. I was humbled and became anxious to learn. I needed to learn. And so I began to experience many things as a child does, including the sense of wonder and joy at new discovery. This gives new meaning (likely not intended by those who wrote the words) to the scriptural injunction that we should "become as little children".

There are sound evolutionary reasons for this division between childish learning and adult doing. We have years as children during which we primarily learn how to deal with our environment, and then a period of time as adults during which we spend most of our time getting things done and creating the opportunity for children to spend the time required to format their brains to a changing environment.

---

[48] Haidt refers to this as a form of impairment or temporary mental illness. See http://www.happinesshypothesis.com/happiness-hypothesis-ch6.pdf.

Accordingly, as the environment changes children develop abilities that their parents often did not have. This is an example of co-evolution – the environment changes and the organism (in this case humans) changes in response, which enables it to cause further changes to the environment, and so on. One does not need to look further for proof of this than to children who were raised with computers.

We have far less need to get things done – to be productive – than did our ancestors. Our instinct to collect, hoard, possess has more than served its purpose, though this is part of what makes us unsatisfied in our world of abundance[49]. As we become more conscious, we will tend toward more learning and creating, and less toward doing and consuming.

And, as long as the IRAS community as I have experienced it on Star Island and over the internet insists that differing points of view relative to religion, god and other potentially explosive concepts remain in dialogue, it will move its membership toward greater consciousness.

Thus, IRAS tends against the blinkering forces that sustain unconsciousness. IRAS also moves us toward the kind of global myth – a religious naturalism[50] – that could create a conceptual infrastructure that directs energy toward the imperatives that are most likely to sustain human life on Earth over the longest possible term. This does what we can about the KKR Emergency.

My feeling of being more alive while I associate with my IRAS friends is a direct result of IRAS helping me to become more conscious. A number of the members of my family have said the same thing. They have noted the degree of diversity and acceptance we experience here. This is the stuff of which our new global mythology must be made.

Falling into Creativity

As noted above, a sense of acceptance pervades IRAS, and I think that is largely responsible for Terry Deacon's statement that IRAS is the world's best brainstorming meeting. While I am sure he would admit to hyperbole here, I also experience IRAS as a remarkable creativity enhancer. Don Braxton likely put his finger on why it performs this function at an unusually high level for scholars like him when he said that at IRAS, people are prepared to put forward

[49] See Jon Haidt, "The Happiness Hypothesis", at www.happinesshypothesis.com.
[50] See http://en.wikipedia.org/wiki/Religious_naturalism.

concepts that are still half baked instead of maintaining the guarded posture that is required in more formal academic settings.

IRAS is perhaps a classic example of how creativity can result from the relaxation of rules in what is for some purposes an overly ordered environment. That is, Star Island's openness perhaps creates an academic edge of chaos for the same reasons that it is an edge of chaos for someone like me. This fits with some of the research James Surowiecki outlined in "The Wisdom of Crowds"[51] – that the wisdom of a group is a function of things like how expert the group's members are; how diverse they are; how well feedback mechanisms work to not prejudice group members before they have independently come to their own views, to collect those unprejudiced views, to inform group members of other views that may change their opinions, to encourage debate and winnowing of views as little affected by things like the authority bias as possible; etc.

One would think that already diverse expert groups – like groups of scientists – have little to gain from admitting "regular" folk. The research disconfirms this. For example, if you have 20 medical doctors working on a medical problem, the wisdom of the group would likely be enhanced by replacing two of them with non-doctors. And the non-doctors do not even have to be especially well-read or intelligent. All they have to do is contribute their points of view, which probably differ from the group norm and this will stimulate new thought.

On Star Island, scientists rub shoulders not only with scientists from other fields (something they can do any day of the week at their home universities) and also with regular folk. As a result, they are often asked smart questions by scientists outside their field, as well as "dumb" questions by the regular folk. And some of these dumb questions bear fruit.

"Play" is another way to conceptualize what happens intellectually on Star Island. That is, we engage in a less ordered and more energetic variety of something "serious" that we do in other circumstances. This brings to mind the paradox Terry Deacon pointed out – that we in a sense "fall" into creativity; that in complex systems creativity is often the result of a move toward less order, from which new complexity then springs. Hence, we are in a sense "degraded" apes. We are undeniably more complex than they are, but our complexity ironically resulted from a series of disorderings. We might be said to have "fallen" from their state to ours through ratcheting down-up steps of greater chaos (down) to greater complexity (up), to greater chaos, to greater complexity, etc. Adam's "fall" in the Garden of Eden narrative was reframed for me as I wrote this paragraph.

Note the sacramental potential in this concept. Partaking of the communion could ritualize the disorder represented by death, and the regeneration that follows. It could be used to encourage us to face – even seek – regenerative chaos. Ironically, many Christian groups (including the Mormons) use the communion for the opposite purpose. They use it to remind the faithful of their sins – the occassions on which they have broken communal rules and hence stepped toward chaos – and to renew their commitment to avoid this potentially disruptive behavior regardless of its renewing potential. That is, the communion is designed to reinforce order and constrain chaos.

The provocative image of apes falling toward human status does not do justice to the fact that each "degradation" is a necessary but insufficient condition for creative steps that follow. I like it

[51] See http://en.wikipedia.org/wiki/The_Wisdom_of_Crowds reviewed at http://www.csmonitor.com/2004/0525/p15s02-bogn.html.

nonetheless because it highlights the necessity of regularly taking a terrifying dip in the chaotic pool from whence life itself emerged. In chaos, we find the energy for continual biological, ecological, personal (to a point) and societal re-birth. And this is one of science's as well as mythology's most constant messages to us. One this topic they speak with one voice.

And did not many ancient rituals go out of their way to infuse social groups with chaos? The winter solstice ceremonies often suspended social mores related to sexuality and other aspects of daily ordered living, and in some societies a fool-king was crowned to wreak havoc while ruling over the festivities. Modern Carnival, Mardi Gras, the perpetual party zone in Las Vegas and even the Calgary Stampede, can all be seen as small scale versions of this old practice.

Chaos may be part of what Karl Peter's has in mind when using his wonderful metaphor "dancing with the sacred"[52]. Chaos of a particular kind – zygoned[53] with order – is our creative ground of being, the slice of Brahman[54] that gives rise to all. We dance with both of these as we co-create ourselves and all else we influence. "The Sacred Depths of Nature" may be order dancing with chaos.[55]

This recalls two ideas related to LSD. First, Francis Crick[56] and other scientists of his generation are rumored to have experimented with small doses of LSD, taken in controlled settings, as creativity stimulators in connection with their scientific work. And, during the same period of time LSD was used in religious studies experiments to see if it might act in a manner similar to the Peyote button and other stimulants traditional Shamans have long used. In such cases it would be fair to characterize LSD as a chaos and creativity inducing agent, and in the religious studies context the effect of the drug was found to be highly context dependant.

In one experiment, LSD was taken in the basement of a church just before Easter services by a group of religiously oriented students. A control group in the same setting took an "active placebo" – a drug that would produce tingling effects designed to trick the subject into thinking they had taken LSD and so perhaps induce a psychosomatic "sacred" experience. Then all listened to the Easter service knowing that if anything went wrong with their "trip" they were safe.

Many of the LSD stimulated students reported an encounter with the sacred that was among the most sacred and moving of their lives. Re-surveyed years after the fact, this impression remained. No "bad trips" were reported. In other similarly controlled experiments where LSD was taken in an insecurity inducing environment, bad trips were far more likely to result and perception of a sacred experience far less likely.

So, God is not LSD, to the disappointment of Timothy Leary and others, but in the right context LSD can be one of countless neural, social, personal etc. stimulants that can inject catalytic chaos into our lives. And I do not advocate the use of LSD or any other illegal drug while noting their potentially useful connection to creative chaos.

---

[52] See http://www.amazon.com/Dancing-Sacred-Evolution-Ecology-God/dp/1563383934 and http://www.metanexus.net/metanexus_online/show_article2.asp?id=7437.

[53] "Yoked". See for example http://www.blackwellpublishing.com/journal.asp?ref=0591-2385.

[54] See http://en.wikipedia.org/wiki/Brahman.

[55] I made the connection between "the sacred" and chaos while typing this – another Star Island blessing; a minor emergent miracle created by the flow of energy within the boundary conditions set by my agreement to prepare this summary.

[56] See http://en.wikipedia.org/wiki/Francis_Crick.

This idea also showed up in Barb Smuts' fine presentation regarding animal relationships. She used video footage of animals at play to illustrate that play resembles other animal activities, but without many of the tightly defined rules that make those other activities effective for a particular purpose. She also illustrated how play is used to teach, form relationships and do other useful things in animal sociality – deordering is again used to produce higher order.

Barb's presentation in conjunction with the "falling toward creativity" aspect of complex systems theory caused me to note and better understand a well-known pattern in my life. I cycle through periods of extreme productivity that lead to such a tightly wound state that I lose the desire to do anything, or find myself spinning my wheels and feeling awful, and then some kind of disorder producing system shock will occur and I will be jarred back into a space that both feels better and causes new, productive forms of activity to come into being. This is followed by a period of extreme productivity, and around we go again.

The constructive system shocks are sometimes things like a Star Island experience or other forms of play, but at least as often slate clearing occurs courtesy of trauma like an important relationship that goes into crisis or an intense period of work at the office that lasts long enough to cause a radical pruning of life's abundance. This presents us with irony that a form of extreme order and discipline in one vector of experience (20 consecutive 16 hour work days; a weekend (or week) long "silent retreat"; etc.) may cause as reduction of order in many other vectors of our experience, and hence may be chaotically regenerative. This is perhaps what led to the misguided monkish notion that if some pruning is good (for the reasons just noted) more would be better and the door to heaven will likely be found by those who can live an existence so Spartan that it is barely life.

While some might say that I just took a lot of time to say "All work and no play makes Jack a dull boy", I think that reframing this old saw in complex systems terms adds something important. It illustrates the principles at work, first and foremost, and so allows us to think in terms of different kinds of play and how they function (or don't function) as creative agents when interacting with different kinds of work. For example, while it is likely that playing a little ball with my buddies or kids on a regular basis will be a good thing for my mental health, I can now think in terms of stimulating particular kinds of creativity with particular kinds of play. If I want to better understand a problem related to legal systems or my religious community, I might go looking for (or invent) a kind of play that is produced by a relaxation of the very rules I am trying to study or more importantly, am trying to cause to evolve. To an extent, the Greek tragedies and other art forms can be understood in this way. They were playing with the rules of their society and so simulating human interaction, stimulating new thoughts, exploring the adjacent possible, etc. This was an important part of the process from which, many argue, new social forms emerged in the Greek world.

I wonder if this might be a way to approach the KKR Emergency? It seems clear that we need new forms of social ordering mechanisms to restrain some kinds of human behavior. What will they be? Complex systems theory pans the idea that we can get some smart people into a room let them figure this out. Our best bet seems to be harnessing the wisdom of the crowd and letting various solutions bubble up from the bottom and evolve as we experiment with them. And, it appears that harnessing the principles of play to enable this process would be wise.

This kind of thinking takes an attractive metaphor and allows us to move toward turning it into a powerful tool. And it explains the existence of the pervasive "all work makes Jack dull" metaphor – it is grounded in physics that as Michael Silberstein and Brian Swimme assured us,

operate in a sense all the way down to the quantum physical level as well as up to the largest cosmos we can presently conceive.

Conference Wrap-Up

One of the conference features that I most enjoyed was the final plenary sessions during which of the presenters was able to make a few concluding comments, in light of all they had heard during the week. Jeremy Shermer[57] acted as a facilitator for this experience. He noted by way of opening that he is a "Daowinist". This is a religion of one – him. Hence, he is "both pope and congregation" in his religion.

Jeremy provided a nice, light touch during this insightful wrap-up session. The following are a few of his nuggets of wisdom:

- Beware of cliched bravura. That is, we often take old arguments, dress them up in new clothes and declare them with great force. And we are often taken in by those who do the same. So ask, "What is really innovative about this position?" before jumping on a passing ideological bandwagon.

- The transaction costs[58] of swapping whole beliefs are high. So keep as many beliefs as possible while making the required changes.

- We all tend to be greedy conclusionists when defending ideas important to us. This is a result of our bias toward social stability and hence certainty in the conclusions we reach. For example, think of those who drew unjustified conclusions from Darwin's ideas and used them for ideological purposes.

- For the same reasons, we tend to be prudy anti-interpretionists when faced with ideas that threaten us. The confirmation bias[59] is part of this problem. This might be called "ideolatry" – the overvaluation of certain ideas.

- The Dao is a pretty good analogy for living in harmony with nature and other people. That is, live consistently in the way that expends the least energy and generates the most creativity. If taken in the long term, this also consistent with what complexity theory teaches us.

Jeremy then asked that each of the speakers make a couple of concluding comments. Since what they had to say encapsulates a number of the important conference themes, I will reproduce here a good part of that.

- Loyal Rue: Loyal used the hourglass metaphor to focus on what he thinks is an important issue. The wide part of the hourglass represents worldwide ideological diversity, which is for the most part fine. However, on some critically important issues – like the environment – we have to agree in order to do what needs to be done. Once we have done that, we can tolerate a lot of diversity again. We have not reached the crucial point of recognition and agreement on the major problems that now face humanity.[60]

[57] See http://www.mindreadersdictionary.com/.
[58] See http://en.wikipedia.org/wiki/Transaction_cost.
[59] See http://en.wikipedia.org/wiki/Confirmation_bias.
[60] Here as well as on other occasions throughout the conference Loyal emphasized the KKR emergency.

- Gordon Kaufman: Emergence can cause emergencies, like our current eco-crisis. Human power has emerged in last century rapidly and now we clearly dominate the planet. So we now face emergencies. We must attend to these. Two among many are: (1) Global warming, caused by technological civilization (not the technology, but us – how we use the technology). Ten years more and we may well pass a tipping point – a point of no return. (2) The political organization of this planet. Perhaps WW III is coming, and will be nuclear. This may be (or start as) a religious war between two of the Abrahamic traditions, each ironically believing that the same god commands war. When do we begin to address these? We don't have much time. Lets get started.

- Stu Kauffman: Agrees with what Gordon Kaufman had to say. He believes that there is a dark side to human future. Nietzsche talked about this as the "will to power". A global civilization is emerging that is creating extraordinary conflict between different belief systems. We have not yet found a way to defuse this. Humanity has a de facto stewardship over our complex environment, and our children's future, with limited foresight. Such is the nature of phenomena governed by complex systems. So we do the best we can. The question is whether we can awaken to our reality, figure out what needs to be done, and then muster a sufficient consensus to do that. He tends to think Loyal is right – it does not seem probable that this can be done. But we should do what we can.

- Michael Silberstein: It is not crazy to think that there might be a self organizing theory of everything. We see patterns of self similarity all the way up and down. For example, the same patterns appear at the quantum level as elsewhere. We should try to tackle this.

- Michael Wysession: We are now earth's largest agent of geological change. Traditions that teach humans that they have dominion over the earth are increasingly dangerous. The job required to avert ecological disaster is so large that it might cause paralysis. But taking no action is still action. We should learn what we can from complexity theory and guide our actions by it. Think of what happens with forest fires. Well intended elimination of small fires truncated a pruning mechanism and created the conditions for massive, extremely destructive and uncontrollable forest fires. The Mississippi project to stop flooding contributed to similar catastrophes. Some actions are worse than no action.

- George Fisher: There is a pattern in the unexpectedness of the things that emerge from complex systems. We should feel our way humbly forward. Is religious insight primarily a way of remembering, or a primary response to the question, "How did all this happen?" The conference was a feast of remarkably convergent, rich ideas.

- Bruce Weber: Paradoxes tend to be resolved in dialectic fashion. For example, we need both an open system and a degree of closure to create life. This is a general principle. We find tension, and balance, all around us. And we tend to use either side of this duality to argue our points as it suits us. A general theory of organization might include the following components: Natural selection is an emergent phenomenon out of self organization and selection at low levels; new principles of selection could themselves emerge from this; relationship is perhaps fundamental to ontology; relaxing constraints and choice both are important in self organizing systems; and timing in various ways is more important than we likely yet imagine.

- Terry Deacon: We face the specter of dualism everywhere. Earth live v. eternal life; us v. them; biology v. spirit; religion v. science; etc. Gordon Kaufman shows how to deal with that in the Abrahamic traditions. We don't have necessarily an either/or choice, as the literalists believe. The "rapture concept", becoming "rapture ready", the "left behind" books, etc. illustrate how tribal – how us v. them – this mentality is. This is terrible in a global environment. We live in a creative universe. Things are not set. It looks as though anything goes from a values point of view. Values are not written on a tablet somewhere. Almost anything works in the right circumstances. A form of relativism might be the answer from a morality point of view. Things that seem horrific to us will be functional for others. However, values are emergent social properties. It is reasonable to presume that they have a small solution space if they are going to produce particular functionality (like human civilization). For example, eyes have independently evolved many times. The same is true for dorsal fins: in dinosaurs, fish, dolphins, etc. They come from different evolutionary directions but converge on the same form because it is functional in a particularly important way. Hence, we don't need to be afraid of relativism with regard to values. The functions they perform are attractors, as are the functions eyes and dorsal fins perform. So, when we run into people from other parts of the universe they will likely have values similar to our own.

- Barb Smuts: How many of us are addicted to nature and feel tremendous humility? (All hands go up). How did we get to this place? How can we help others to get to this place? These are our crucial questions.

- Guy Hoelzer: Co-evolution is like quantum entanglement[61]. This illustrates that point that ontology may be basically relational. The history of words makes it hard to work with new concepts – like old bottles for new wine. Many disagreements are illusory; caused by language problems. Optimism v. pessimism: The future will unfold through the adjacent possibles. There are far more paths than we can imagine. Hence, Guy is optimist. But, what will the solution cost? That is hard to say. The important question is how can we perceive as much as possible of the landscape related to our future possible paths and so bias the probabilities toward a less costly path. When we think in terms of cost, we should remember that many solutions to what is currently developing don't include us. Solutions for universe are not necessarily solutions for us. This emphasizes the importance of the cost question.

[61] In Guy's lecture he treated us to several examples of organisms that are wholly dependant on each other for existence. Destroy one and you destroy the other(s). None of those is a given system come into being without the others. Each part of the system has no functional substitutes. Are these systems a form or detached or remotely functioning organism? Their actions affect each other at a distance in a way that is reminiscent of quantum entanglement (see http://en.wikipedia.org/wiki/Quantum_entanglement), as is co-evolution (see http://en.wikipedia.org/wiki/Co-evolution).

Coming and Going

One of complexity theory's key insights is that creativity mostly occurs in liminal[62] space – the chaotic (or at least less ordered) borderlands between more ordered spaces. As Terry Deacon put it, we "descend" into higher orders of complexity by dipping into chaos and then experiencing emergent miracles. This prompted Bruce Naylor to tell me while at Star that the only two physical rules in the Universe are that: (1) energy will be minimized, and (2) irony will be maximized.

But in any event, the importance of liminal space helps to explain why getting on and off the island has such an interesting feel.

Star Island is a classic liminal space for many who travel there. We go for the purpose of being creatively disrupted; to encounter sometimes violently jarring ideas; to drink from chaos' nourishing font.

For those who travel more than trivial distances to Star, the ferry at Portsmouth (now Rye) is the end of the journey. We left our ordered lives when embarking the journey hours before, and as we pull into the Rye parking lot we know that we are about to meet our old friends and make new ones as we engage in the stimulating process I described above. We begin to see familiar faces. We know that within minutes we will be engaged in stimulating conversation. We are excited because the adventure for which we have come is about to begin. We enter creative,

[62] See http://en.wikipedia.org/wiki/Liminal.

sacred space at Rye Harbor. Star starts there. We chat excitedly while waiting. We board the boat and hardly notice the trip. We are off and running.

The trip off the island is the mirror image of the trip to it. Many goodbyes are said on island. We are tired. The trip back to Rye passes mostly in contemplation. The goodbyes on the Rye side limp. Liminality ends; creativity shuts down. It is time to digest, and prepare for a return to more rigid climes where life moves in more ordered rhythms and the effect of Star Island's creative rush will largely dissipate, having performed its life giving function.

However, Star seeds are hardy, and given little opportunity they will fly from ear to ear, often sprouting years from their planting in unexpected places. We at times despair at how slowly good ideas seem to spread. And then we hear stories like the one told at Star about the 9-year old girl who while arguing with a friend about something was heard to say, "The big bang has everything to do with it, stupid!" At some least of the rising generation have a degree of awareness that we cannot comprehend.

As Guy Hoelzer said in his wrap up statement: "There are far more paths than we can imagine." In this creativity we trust while doing what we can in faith that more good than ill will come of it, and enjoying life's unfolding miracle while it lasts.

Rocky Mountain Fall

Home felt wonderful when we arrived, and summer's lazy days have turned as crisp as work has again taken over life.

The picture below was taken in our backyard as I finished this report. Fall has been my favorite time of year as long as I can remember. Now I have new reasons to celebrate what it represents while enjoying the show it puts on.

Appendix - Complexity Theory for Dummies (Like Me)

Introduction[63]

What follows is culled from the notes I made just prior to, during, and following the conference this year as I attempted to understand complexity theory and to digest what I had learned at the conference. Complexity theory – and particularly the part of it that applies to self organized systems (SOSs) or complex adaptive systems (as SOSs are sometimes called) – is a particularly powerful explanatory paradigm.

Questions about how and why nature is organized fascinate humankind. Observations of nature, and theories to explain those observations, gave us religions of all kinds, proto-science, and science.

One of the basic questions is, "Why is there not more variety?" That is, the forms we observe in nature are only a small sub-set of those theoretically possible. The answer to this question seems to be found in the order that gives rise to the forms we observe.[64]

Many natural systems produce similar kinds of form or organization (e.g. galaxies, planets, chemical compounds, cells, organisms and societies). Traditional scientific fields attempt to explain these features by reference to the laws applicable to their component parts. Gravitation and chemical bonds, for example, are used to explain many forms. This is a kind of micro analysis. The study of complex systems is an attempt at macro analysis. That is, instead of looking for explanations of the form of individual parts in the details of a system, we look for overall system characteristics that explain a wider variety of forms.

In both micro and maco scientific analyses we tend use a process resembling what is depicted below.

[63] It is hard to improve on the summary of complex systems theory, and SOSs in particular, that is found at http://www.calresco.org/sos/sosfaq.htm#1.1. What follows in this introduction borrows liberally from that.

[64] See Stephen Wolfram, "A New Kind of Science" at http://www.wolframscience.com/ for a monumental treatment of the work currently being done in this field.

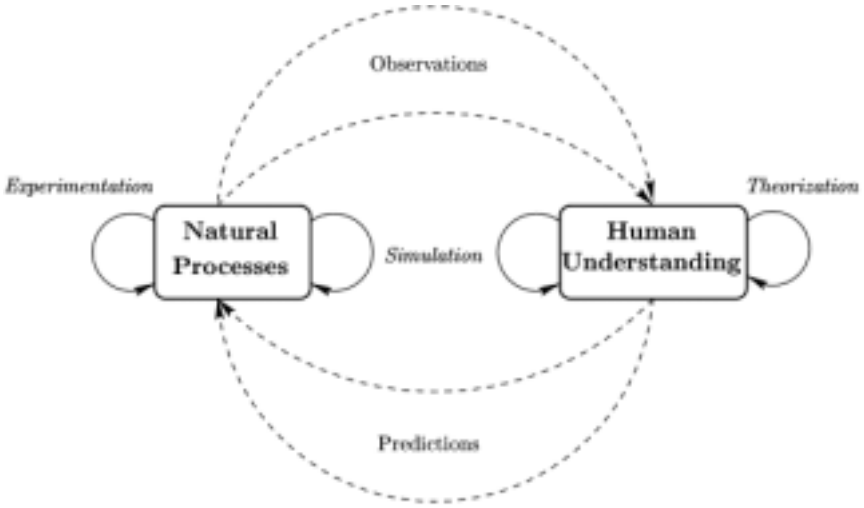


Figure 24.2 The universe of natural processes related to scientific understanding

We face time and scale problems when attempting to study many natural systems. That is, the scientific study (ie. study based on testing and falsifiability) of any phenomenon requires time scales appropriate to the phenomena in question. This restricts our studies to qualities that are reproducible in laboratory conditions. We can reproduce certain chemical reactions, for example, and hence study many of their aspects in detail. However, the study of cosmology, or even geology and sociology, is much more difficult because the processes we are attempting to understand cannot be replicated in a laboratory or other kinds of precise experiment. Complex systems theory deals with this by modeling the phenomena in question using computers, while acknowledging that models are not reality. Given the nature of the part of reality in question, models are the best we can do.[65]

Mathematics is a language that can describe (approximately, at least) most aspects of reality with which we are familiar. We can create mathematical models of dynamic, non-linear[66] systems that produce results that seem to resemble what we observe with regard to phenomena like weather, financial markets, biological evolution, etc. We can run computer simulations to test the results produced by the model against our observations. In this way are able to explore many starting positions and combinations of system variables, and analyze the patterns that result.

Even small systems have almost infinite initial options, so even with the fastest computers currently available we can model only a small part of the possibilities. Yet this is often enough to produce unexpected outcomes and generate new theories regarding the nature of complex systems that can be tested through traditional scientific means.

---

[65] See Joshua Epstein's thoughts on this topic at http://www.econ.iastate.edu/tesfatsi/Epstein.ABMIntro.pdf#search=%22%22joshua%20epstein%22%20brookings%20agents%22, and http://www.pupress.princeton.edu/titles/8277.html.

[66] See http://en.wikipedia.org/wiki/Dynamical_system.

What is an SOS or CAS?

Self organizing systems (SOSs) and complex adaptive systems (CASs) are terms that are for the most part used interchangeably. I will use SOS.

SOSs tend to be balanced on the edge of chaos, to use Stu Kauffman's term. That is, SOSs occupy a part of complex systems space that is on the border between the more ordered and more chaotic of those systems, as illustrated below in the space labeled "complex".

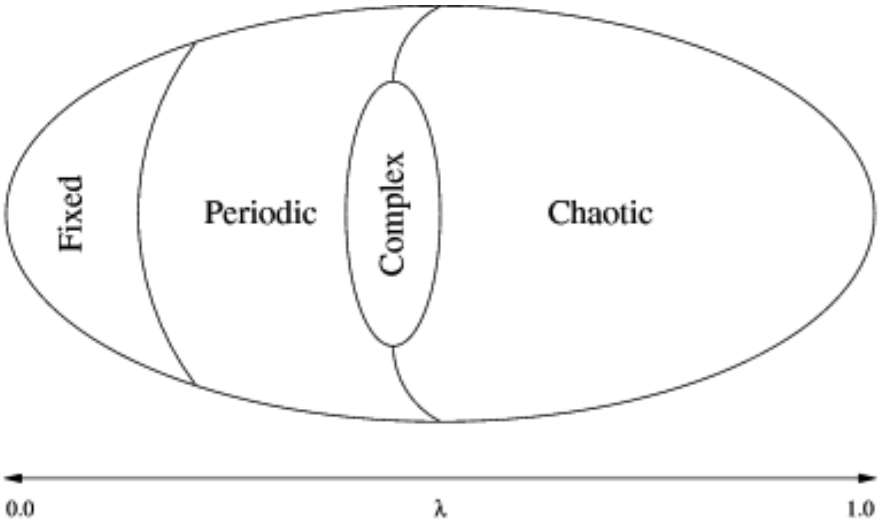


Figure 15.9 Langton's schematic representation of CA rule space characterized by the λ parameter

This straddling of order and chaos produces the "whole is greater than the sum of the parts" phenomenon that is at the heart of emergence, and the capacity to stay sufficiently connected to a changing environment in order to survive. This is life's dance.

The study of SOSs looks for general rules that govern the growth and evolution of systemic structures.

Aspects of SOS structure often appear without influence from outside the system. That is, some of the main constraints on form (i.e. organization) are within the system. These result from the interactions among the system's components. The system structure sometimes evolves and at others is stable.

The main current scientific theory related to self-organization is Complexity Theory, which can be summarized as follows: Critically interacting components self-organize to form potentially evolving structures exhibiting a hierarchy of emergent system properties.

The elements of this definition[67] relate to the following:

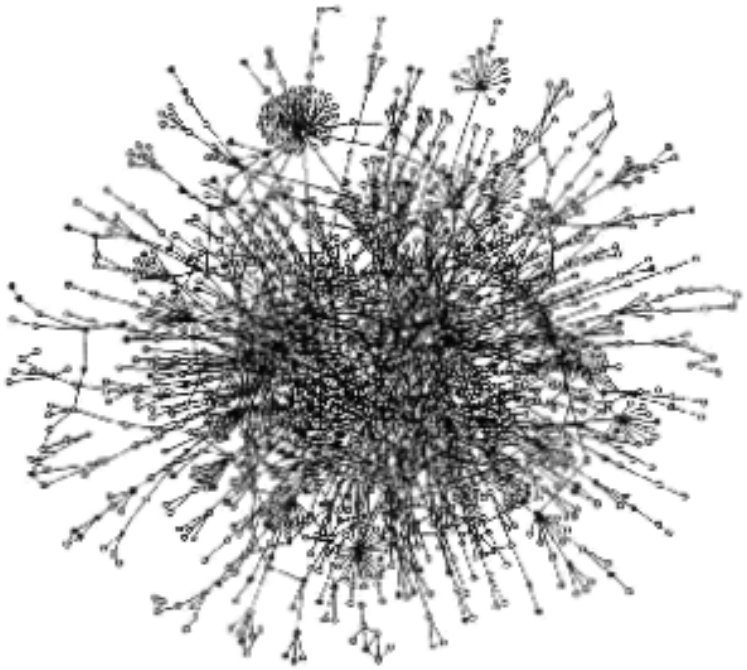
- Critically Interacting – SOSs are information rich and have elements of both order and chaos;
- Components - Modularity and autonomy are both involved;
- Self-Organize - Attractor basin structure is generated by contextual interactions;
- Potentially Evolving - Environmental variation selects attractor characteristics;
- Hierarchy - Multiple levels of structure appear;
- Emergent System Properties - New features appear and require new vocabulary

With that background, let's move into some examples of how an understanding of SOSs and complexity theory can be used as a basic explanatory paradigm for many aspects of life. I am consciously extending complexity theory beyond its borders in much of what follows. This can be thought of as the proposition of hypotheses for further, as well as a mythology[68]. Mythologies have always been ideas about what is real, but not testable, and that are consistent with our basic beliefs about reality. As a methodological naturalist[69], I restrict my beliefs as to what is real by the probabilities that can be reasonably inferred from scientific knowledge. Hence, I accept the explanations offered by complexity theory for many social phenomena as the most likely to be correct of those we have to work with, while admitting that they are speculative. My beliefs in this regard fit the classic definition of mythology. This is a scientific or naturalistic mythology in the sense that it attempts to be consistent with science and naturalism.

The Universal Diagram[70]

Imagine a typical diagram of the interactions between agents within a complex system such as the one below[71].

[67] See http://www.calresco.org/sos/sosfaq.htm#1.1 for a discussion of these terms.
[68] See http://en.wikipedia.org/wiki/Mythology.
[69] See http://en.wikipedia.org/wiki/Naturalism.
[70] A special thanks to Guy Hoelzer for the Universal Diagram, Traffic Analogy and several of the other concepts that follow. He spent several hours on the porches at Star patiently tutoring me, and provided me with a number of useful metaphors on which many hours of my previous reading was immediately hung.
[71] From Philip Ball's "Critical Mass". A number of the diagrams and concepts that follow come from Ball's book, which I highly recommend. It is the single most useful source I have found in terms of understanding how the physical science of complexity might be carefully applied to the social sciences.



16.6 A part of the yeast metabolic network. The vertices are molecules either supplied to or manufactured by the network, and the links (edges) are defined by the enzymatic chemical reactions that convert one molecule to another.

The nodes on graph are agents or organisms – like individual humans, or ants, or molecules. The lines are connections over which energy, information etc. flow between agents.

As Guy Hoelzer puts it, we can think of all reality as being composed of nothing but things and processes that define the interaction between things. But when you look at any one thing carefully, you find that it is also composed of smaller things and that those smaller things interact with each other within a system that is the larger thing.[72]

For example, start at the lowest possible level – say quarks – and draw a graph showing how the quarks relate to each other. Then, stand back and look for clusters. These are often other "things". We then treat those as agents and draw a graph that shows the communication among them. Then again, stand back and look for clusters. Atoms? Molecules? Etc.

We can do the same for cells, individuals, social groups, ecosystems, the Earth, the solar system, galaxies, the known universe and countless other "things" and "processes" in between. We end up with a set of nested, multidimensional systems within multidimensional systems. Our graphic illustration of the concept helps to understand what is going on without accurately describing it.

[72] Interestingly, this is precisely the way in which Alan Watts and others teachers of Eastern disciplines present the big picture of reality. We are a part of the whole, which is itself The Divine. A number of people have attempted to correlate both Eastern and Western religious or philosophical ideas with the best social theory current has to offer, and have found that the Eastern approach fares well in this analysis. See Marvin Levine, "The Positive Psychology of Buddhism and Yoga" for example.

We can analyze each system in isolation to a degree. But some effects at very low levels ripple a long way up, or at high levels ripple a long way down. That is, we are dealing with a single integrated system.

For example, changes in large scale patterns of social behavior can start with a neural tipping point[73] caused by one bit of information, and the formation of important patterns of neural connections can be triggered by a small change at the societal level. It is all one massive system. There is connectivity – if not turtles – all the way up and down.

How Patterns Form in Complex Systems

The definition of "agent" relative to "system" as we work up and down the universal diagram works on the basis of information flow. That is, there is lots of information flow within agent, and relatively little between agent and the system that contains it – its environment. Think of information flow within a cell v. inter-cellular communication. Or information flow within a human individual v. between members of a social group. Or information flow within a small social group (like a religious congregation) v. communication with other groups.

Boundaries between agents and systems, and between attractor basins within systems, are areas of low information flow – a kind of membrane created by an absence of information. These information differentials create differences between the properties of agents and hence different behaviors between attractor basins. Think of the behavioral differences between the Danish and most Muslim Arabs in the Near East.

Attractor basins are often the product of conditions and histories that cause a certain type of relatively consistent behaviour among agents, like the weather patterns in the Artic v. the US Gulf Coast, or Federal voting patterns in New England v. Utah. They can be imagined as the basins between peaks on a graph like that found in the figure below.

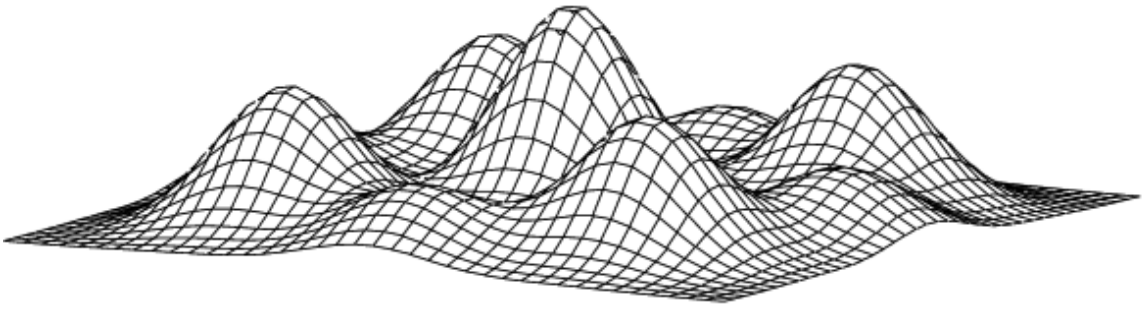
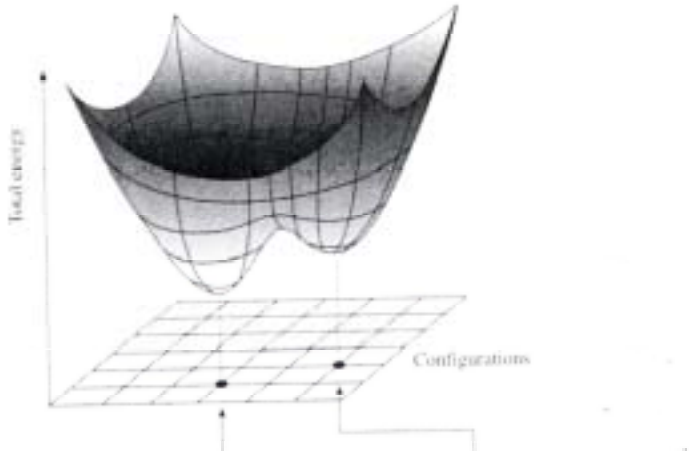


Figure 20.2 A two-dimensional function to maximize

A particularly deep ideological attractor basin might looking something like this:

[73] A colloquial term for what is often a phase transition.



Attractor basins create clustering that could lead to something that would be defined as an agent at a higher order of analysis in the universal model. Think of individuals clustering into religious groups. Religious groups are organisms of a sort that can be depicted as nodes on a graph illustrating how religious groups interact.

The kind of three dimensional representation shown above and others that follow are crude models of our partial (at best) understanding of how reality works. For example, landscapes of the type depicted above have been used to understand how biological evolution works. There is a huge number of variables that influence biological evolution. The relationship between these variables is non-linear, thus creating the kind of system that complexity theory helps us understand. Since we can't visualize more than four dimensions, those many variables are collapsed into three and depicted as a three dimensional landscape. A fourth dimension is added by showing how the landscape changes over time.

For example, if the landscape changes so that trees darken due to soot during the industrial revolution, the basin that once comfortably housed white moths hiding on the bark of light colored trees would turn into a hill as the moths find themselves being devoured by birds in the chaos between attractor basins. Many religious literalists are now going through something that to many of them seems similar.

We recognize that our models do not capture reality and are in most cases crude caricatures of it. And when trying to visualize and hence understand how those models work, we further simplify them relative to the reality they attempt to describe as we reduce many dimensions into three or four dimensions. It is important not to lose sight of the relatively tenuous connections between our models as we graphically represent them, and the reality we are attempting to understand.

That having been said, Guy Hoelzer used the following thought experiment to help us visualize the kind of results produced by the computer model that was the center piece of his lecture.

Imagine a world where the decision as to whether we will drive on right hand side or left hand side of the road has not been made. The first day we drive out onto the road, we will make our

decision as to which side to drive on based on our first few interactions. If two of the first three cars we encounter are driving on the right hand side, we will do the same.

If the environment is the same in all directions (same number of cars per square mile, same pattern of roads, etc.) pockets of left or right side driving would develop by random chance, with areas of turbulence between them as drivers transition from one way of doing things to another. Guy's model showed that random variation is enough to cause this patterning, just as is the case with Bernard cells[74].

In a "real" environment where there are variations in how many cars there are in different places (cities v. rural areas, for example), how the roads are patterned, histories with regard to left or right handed driving habits, etc. traffic would be influenced by more than chance. But still, it would go one way in some places and the other in others. Sparsely populated regions would be turbulent and hence dangerous, and clear boundaries would reduce turbulence, as is the case between England and the rest of Europe.

The need for safety and proximity to other drivers in densely populated areas creates an "attractor basin" that causes a consistent behavioral pattern based on lots of information circulating within the basin. The disorder between attractor basins is a function of the relatively small amounts of the information (and hence its lack of pattern) in circulation between the attractor basins.

The degree of similarity within attractor basins in complex systems forms a "fractal"[75] pattern. Fractals have information carrying capacities and other characteristics that are important components of complex systems. Hence, one of the ways to determine whether a particular system is likely complex is to look for fractal patterns.

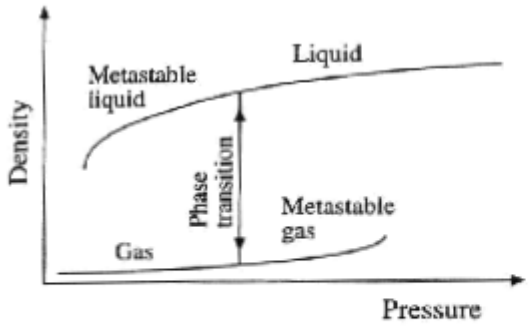
In sociological terms, we can think of the relatively ordered patterns that represent different religious groups as intellectual attractor basins (as well as often physical attractor basins since people with similar beliefs and other social characteristics tend to group together[76]) that display a particular order in a landscape that is characterized by different order or disorder. Human cities (as well as ant hives and other biological forms) spontaneously form on this basis[77], with certain kinds of business and industrial sectors grouping together (the shoemakers here, the silk merchants there, etc.) while residential neighborhoods tend to be dominated by ethnic and other social groups as long as they perceive themselves to be distinct (Italians here; Chinese there; Jews across town; etc.

Phase Transitions

A "phase transition"[78] occurs when the state of a system changes radically, as indicated by the diagram below.

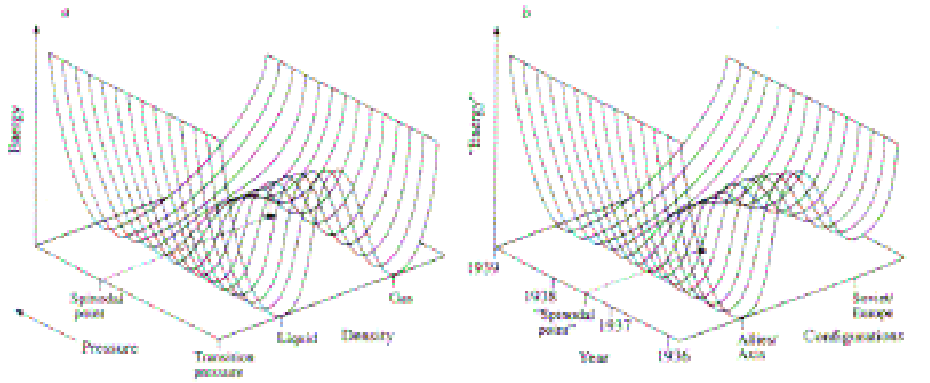
---

[74] Patterns in boiling liquids.
[75] See http://en.wikipedia.org/wiki/Fractal.
[76] See http://mason.gmu.edu/~mmakowsk/AccidentalAtheist.pdf#search=%22iannaccone%20accidental%20atheist%22.
[77] See Steven Johnson, "Emergence".
[78] See http://www.calresco.org/sos/sosfaq.htm#3.4.



13.6 The first-order phase transition between a liquid and gas (evaporation or condensation) can be induced suddenly by only a slight change in pressure. Each state can persist metastably beyond the transition point, until the branch ends at a spinodal point (see page 292).

In this case we are dealing with a change from liquid to gas that suddenly occurs as certain combinations of temperature and pressure are reached. Another depiction of the same process is as follows:

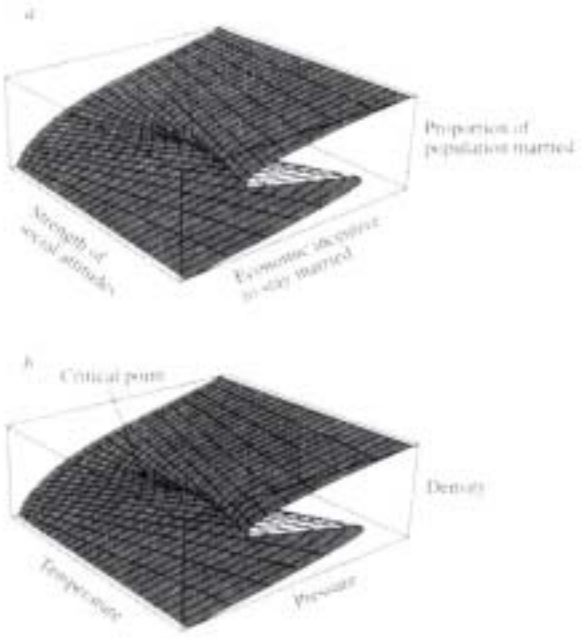


12.5 At a spinodal point, the less stable of the two possible configurations of a fluid (the metastable state) vanishes (*a*). Something analogous happens in the landscape model of national alliances between 1936 and 1939: history seems to pass through a kind of spinodal point at which the anti-Soviet alliance ceases to be viable (*b*).

The same concept can be applied to Guy's traffic flow example as follows: Gradually increasing traffic flow in the relatively "empty" chaotic state between cities would eventually produce a systematizing of traffic flows there. This change would likely be sudden, even though traffic flows increased slowly and steadily. This can be thought of as a movement from one attractor basin (dominant pattern of behavior) to another.

Or how many Italians would have to gradually move out of an Italian neighborhood before it lost its "Italianness" and there was a flood of non-Italians into the area?

Similar patterns have been observed with regard to divorce rates, as indicated below.



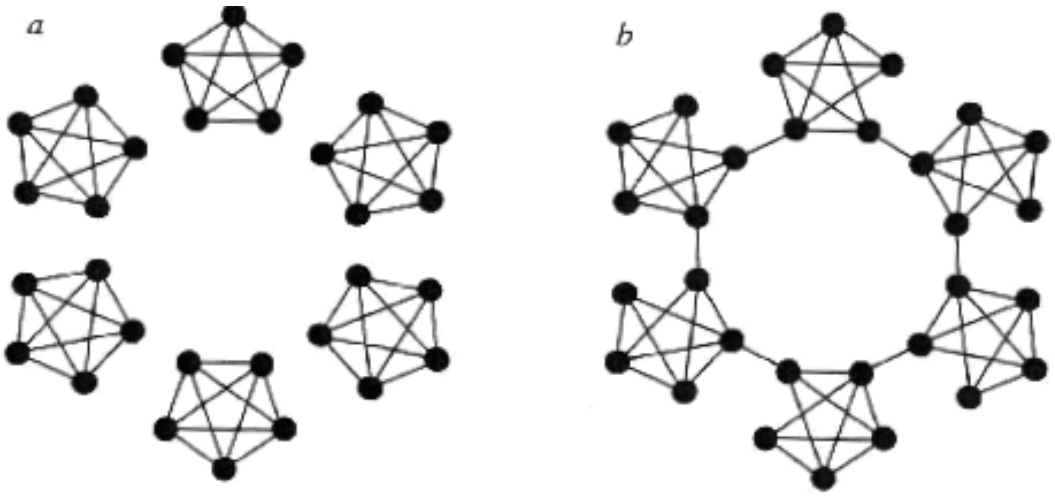
13.13 The dependence of the marriage rate on *both* of the factors in the model—social pressures and economic incentives—can be represented as a surface in a three-dimensional plot (*a*). This surface has a fold: outside the fold, a given set of social conditions allows for only one state of the system, while inside the fold there are two possible states. The fold ends at a kind of critical point. Exactly the same behavior is found in the dependence of the density of a fluid (liquid or gas) on its temperature and pressure (*b*).

A phase transition on an energy landscape[79] would be shown by an attractor basin leveling out or changing into a hill, and the agents formerly held by it shifting to one or more other attractor basins.

To continue our traffic analogy, a phase transition could occur in a “right side” town if people from “left-side” towns started moving in, and over the course of a period of time came to dominate the place, then occassionally started to drive on the left-hand side in their own neighborhoods or on special “left-side” occasions, and eventually changed the driving habit for the entire town as a show of political force (or whatever).

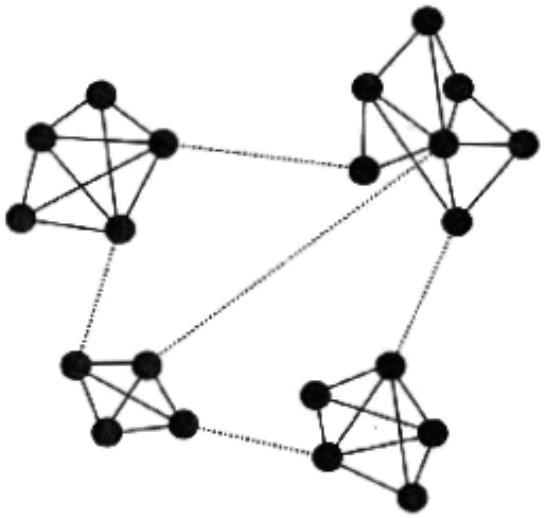
For example, consider the following possible ways of configuring the flow of information within a group.

[79] See the “mountain-like” diagram above.



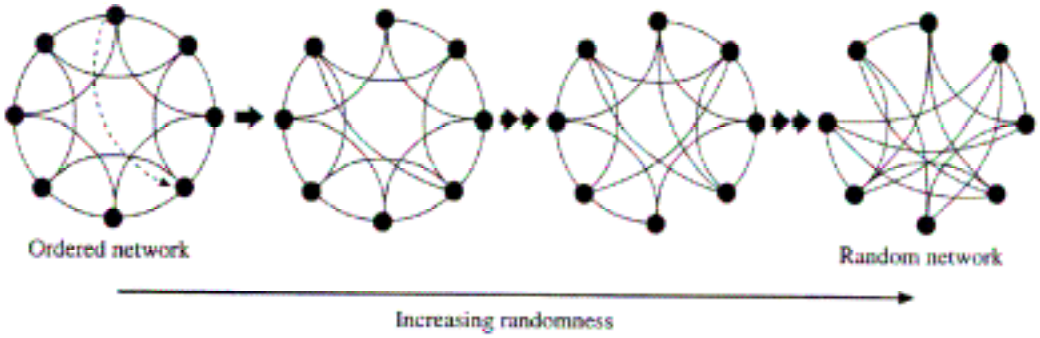
15.6 In the "caveman world" (*a*), people form social clusters that are closely linked internally but are isolated from one another. Even if this graph is made fully connected by linking the "caves" (*b*), the characteristic path length is long.

This illustrates the relatively disconnected structure of primitive, or inefficient, communications systems. As systems become more developed and robust, their form changes to something that is more interconnected, like this:



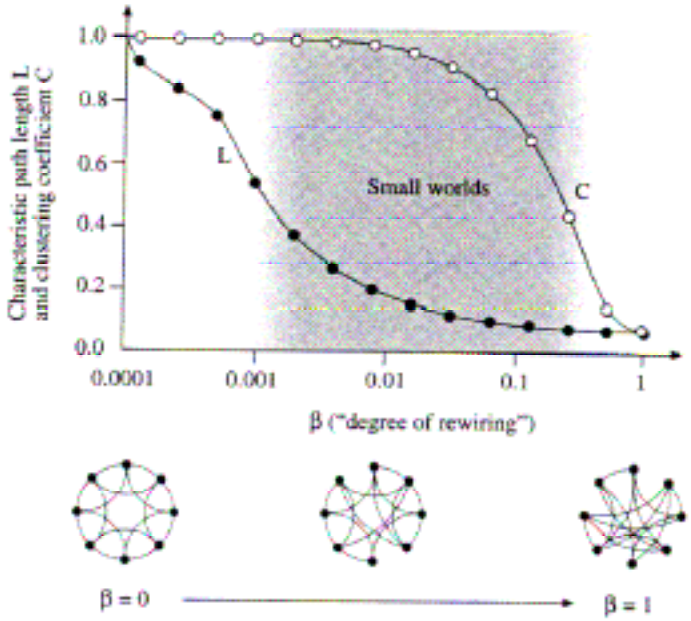
15.1 A friendship network. Clusters of close friends are typically linked by weaker acquaintance ties (dashed lines).

Communications networks can be understood in terms of their degree of orderliness v. random (chaotic) organization. This is one way of determining whether a network is likely SOS. It is too random (chaotic) or too ordered, it will not have the SOS pattern. See the different networks below, for example.



15.7 Random rewiring of a ring of vertices gradually converts an ordered graph into a random one. Somewhere between these two extremes lies the small world.

This illustrates the transition from an ordered network or system toward a chaotic or random system. The effect this change has on the average length of communications links, and hence how efficiently and quickly information should flow within the system, can be illustrated as follows:



15.8 The characteristic path length L and the clustering coefficient C for a rewired ring graph change rather abruptly as rewiring proceeds. The quantity ß here is essentially a measure of the extent of rewiring. Notice that the horizontal axis has a logarithmic scale, which means that small values of ß are "stretched out." This is so that it is easier to follow the changes in L, which happen mostly in the first few rewiring steps. L and C are both large in the ordered ring graph and small in the random graph. But they do not both change at the same stage. Graphs with large C but small L are small-world graphs.

That is, as random communications links are added little seems to occur for a while in terms of the average length of communications links between agents within the system. And then the average length suddenly plunges. This represents a phase transition from a communications since each agent has access to much more information from other parts of the system. This would often cause a social phase transition as well. See my comments below under the heading "SOSs and Social Phase Transitions" for more on this topic.

In social groups, deep attractor basins often become high mountains after a phase transition. Think of the anti-military attractor basin that resulted in Japan after WWII. And it is common for former literalist religious people who have rejected their inherited beliefs to feel near allergic to certain kinds of religious discourse or behavior. Those who have interacted with Benton Stidd and me on the IRASRN listserve will know what I mean.

The collapse of an attractor basin causes the agents formerly in that basin to roll into one of the adjacent basins, thus giving us the idea of the "adjacent possible". That is where an agent has some chance of ending up as her dominant attractor basin changes. This idea can be used to think about what is likely to happen to an individual as her beliefs change in a landscape of alternative religious beliefs and communities with which to associate, or how a religious institution or organism is likely to change as the political, information and other aspects of its environment change.

The relationship between the individual and her attractor basin is unique. That is, the Mormon attractor basin for me was different than it was for other Mormons. In some cases those differences would be minute, and in others they may be huge. The landscape models we use to try to understand how religious communities works are hence representations of the relationship between particular individuals and their religious communities, that are aggregated into an average that should be thought of as representing a probability distribution. The nature of the probability distribution will be a function of the nature of the group. Some tolerate more diversity than others, for example.

My case is instructive. My life used to be deep in a Mormon attractor basin. As a combination of information and personal events leveled that basin out for me, I first rolled into an adjacent basin that used a form of New Age mysticism, Intelligent Design and other concepts to make sense out of the world. But this was a relatively shallow basin since my experience with Mormonism gave me an intense allergy to deep ideological basins[80] of most types. These would be represented by hills in the landscape. As I got to know my new attractor basin, it too fell apart. But it had served me well since from it a variety of other attractor basins – new adjacent possibles – were within reach that were not in the set of adjacent possibles from my Mormon basin.

This kind of analysis brings a number of useful concepts into focus. For example, it illustrates why we should not expect religion to be monolithic in its effect on people. My attractor basin related to religion, and set of adjacent possible attractors, is a unique reflection of me – my genes, historical interaction with my environment (Mormon and other), etc. This landscape and my place on it is a function of countless prior emergences out of the many interconnected complex systems that comprise and affect me. So the Mormon attractor basin for me is different than it is for anyone else, and while there are some powerfully predictive patterns in that attractor that at some point will likely be relevant to most Mormons, its ability to hold me (or not) should be expected to be different than for other people. Another way to think of this is that

[80] Most of these are dogmatic basins.

Mormons will be more like each other than they will be like Muslims, but there is still a large range of different kinds of Mormons, and hence Mormon environments. Guy Hoelzer showed us that random variation can account for the kind of patterns we see in nature. Hence, we should not be surprised that in social settings where things like geographic separation, differences in host cultures (urban New York circa 2006 v. urban Berlin circa 1935 v. rural Utah anytime, etc.) are taken into account, radical differences between Mormon communities and individuals are possible. And these not only affect the nature of particular Mormon attractor basins, but also their sets of adjacent possibles.

For example, what might be attractive to a Mormon living in Tokyo or Montreal as a possible alternative to Mormonism may repulse most Utah Mormons. And as Mormonism continues to emphasize practice over belief[81], the Mormon range of belief will continue to widen and eventually this will result in Mormons tending to think more for themselves and ceding less control to Mormon authority.

This analysis draws our attention to the kinds of personal factors that tend to result in the collapse of attractor basins related to religion. Among the important of these are the behaviour of a person's closest half dozen or so associates, her access to information that disconfirms the religion's truth claims, her personality (and particularly her openness to new experience and tendency to need to know where things come from and where they are headed), and the appearance in her life of emotionally moving experiences that highlight the religion's shortcoming, such as falling in love with someone who does not accept the religion's beliefs or practices or experiencing first hand the negative effects of dogma (like being a gay person in a fundamentalist religious group).

Agents and Systems; Giving up the Adjacent Possible

As noted above, at any given level within the universal system[82], agents must be simple relative to the system of which they are part. And agents invariably give up some properties in order to give the system it's higher order properties and hence ability to process information and create new orders of various types. That is, the agents must give up some of their adjacent possibles to create the system.

For example, fathers and mothers often give up the chance to pursue other relationships and/or career opportunities in order to parent children; members of military alliances or trade unions or business partnerships agree to do, and not do, certain things thus giving up part of their adjacent possibles in return for being able to tackle projects together that they could not realistically undertake on their own.

The physical laws that determine how energy (and information) flows from one part of a system to another seem to have analogies that run from top to bottom of the physical and social worlds. For example, think of how economies become more productive through specialization. At a subsistence level, a human group of a few families could provide for all of their needs – raising food; creating shelter; protecting against certain risks. Agricultural practices eventually made it possible for a few members of the group to produce more food than the group needed, freeing up human energy for other tasks. But no one forces us to live differently than our hunter/gatherer ancestors did, and in fact some people choose to live that way. However, most

[81] That is, as long as you attend, do what you are told, pay tithing, and don't talk about your beliefs that conflict with Mormon orthodoxy, we don't care what you believe.
[82] We tend to think of each level as a separate system, such as human societies for example.

of us specialize given the chance to do so. Hence, I might focus all of my attention on making ever more useful and attractive shoes, rely on others to produce food, and trade my shoes for their food. By using my time and energy to learn to produce shoes I have given up the chance to farm my own land and become self sustaining – I have given up an "adjacent possible" and so have traded the chance to be independent for the chance to integrate with a larger, more complex, more powerful, community. As a result, I know more about less. On my own, relative to my environment, I am "dumber" as is clear in my case each time I return to the farming and ranching environment in which my ancestors thrived to help with calf branding. But the collective economic power of my group radically increases as we develop complementary knowledge and abilities. We also become dependant on each other, and as Jared Diamond has chronicled[83], these dependencies can cause social orders to collapse in unexpected ways. The more substitutes and other forms of redundancy we have in the system, the less likely system collapse will be.

The selection and competitive pressures of biological evolution pushes biological systems toward a fine balance between overall system complexity and power and the redundancy required to make the systems resistant to failure when attacked by disease or other deleterious forces. For example, the universal diagram above approximates the pattern of most metabolic systems as well as the Internet and most other spontaneously created human communication structures. And there is a lot of evidence that other important aspects of human social groups evolve toward a similar state for similar reasons – the need to balance the capacity to produce certain kinds of goods and services in the most efficient manner possible against the need to withstand certain kinds of shocks to the system. The Internet is a good example. Its structure illustrates a good balance between the efficient transmission of messages and protection against the failure of even quite a few communications links.

Social rules tend to reduce the decision making scope of individuals. Think of rules that direct young people into shoe making instead of farming or nuclear physics; that cause us to drive on the right side of the road instead of the left; that cause us to tend to agree with our dominant social group regarding religious, political, environmental etc. questions. These rules all prune our adjacent possibles. Denial, lack of consciousness etc. help to hold these rules in place by allowing us to maintain the illusion that we are more self-conscious and self-determining than the objective consideration of our behaviour indicates us to be. Thus denial and the complex of cognitive biases[84] and other mechanisms that contribute to it prevent us from knowing how much freedom we have in social contexts, thus simplifying behavior, thus making complex social interaction possible. Denial is hence adaptive to a degree.

And as is so often the case, system characteristics that developed for adaptive reasons are used within the system for exploitive purposes as well. As long as the adaptivity of the trait outweighs its dysfunctional uses, it will survive. Hence, cheaters, free riders and parasites of various kinds take advantage of the human tendency to be influenced by social authority and other cognitive biases. We see the same behavior in this regard in the business, religious and other communities. Because of the privileged place religion occupies in our social groups, it is exempted from many of the rules that restrain immoral behavior in other spheres. This is part of what several recently published high profile books have criticized about the religious aspect of modern society.[85]

---

[83] See "Collapse".
[84] See http://en.wikipedia.org/wiki/Cognitive_bias.
[85] See Sam Harris, "A Letter to a Christian Nation" and "The End of Faith"; Daniel Dennett, "Breaking the Spell"; Richard Dawkins, "The God Delusion".

Rule structures are required to restrain cheating, parasitic behavior. Rules, mores etc. of this type are a form of group wisdom. Democracy is an example of this in the way it restrains the exercise of power, as are the securities laws that require "due diligence" and "full disclosure"[86] before shares can be sold the public. As noted above, rules of this type are not applicable to religious institutions and their sales practices.

The more energy there is within a given social system, the more rules (the more giving up of the adjacent possible; the more agent cooperation) are required to maintain it. More people, more wealth, more consumption, more technology – all lead to an increase in the amount of energy within a social group. The human energy on planet earth is rising. We will need more ordering principles to sustain the pattern that is human society. These may include new international laws like those that were recently put in place to form the European Union or to deal with the hole in the Ozone layer[87]. Others may take the form of the kind of social order that has made crowded places like Japan and India function for many centuries. And we may invent new rule forms by combining Eastern and Western ideas, or creating new ones. The most recent data collected regarding the rising generation in the Developed world[88] indicates that its values regarding work (less), consumption (less), respect for institutional authority (less), concern with regard to the environment (more) are quite different from their parents'. For the most part, this shift in values indicates that the ordering principles we need are in the process of forming. However, as KKR emphasized, while it is important that we do all we can, that may be too little or too late.

Examples of Self Organizing Systems (SOSs)

As noted above, SOSs are a particular type of complex system (nodes and communication between nodes) that exist on the "edge of chaos". That is, these systems are poised on the boundary between chaotic systems (like weather, for example) and highly ordered systems (like a pendulum swinging or car motor functioning). This means that there are two ways for an SOS (like an ecosystem or human group) to evolve. It can move toward chaos, in which case the energy levels within the system rise (think of a pot of water starting to boil) and the system must either evolve to contain and channel this energy or it will blow apart. Or, the system can move toward greater or – stasis (think of a pot of water cooling toward the freezing temperature) in which case new energy sources must be found or the system will eventually die.

The SOSs we are most interested in (like the ecosystems that support life, us as individual biological systems and us as we interact in groups) interface with changing environments. Importantly, SOSs have the ability to change in response to a changing environment - they are capable of "co-evolution" (see http://en.wikipedia.org/wiki/Coevolution) and hence survive in the long term.

SOSs that are moving toward stasis (greater order) become less able to change and hence sometimes fall so far out of step with their environment that they can no longer survive in it. That is, too much stability will kill you. Consider, for example, the dinosaur. A radical change in the nature of earth's ecosystem was too much for that organism to withstand. Its success in a particular environment had caused it to become heavily dependant on the characteristics of that

[86] See http://en.wikipedia.org/wiki/Full_disclosure.
[87] See http://en.wikipedia.org/wiki/Ozone_depletion.
[88] See Renata Siemienska, "Intergenerational Differences in Political Values and Attitudes in Stable and New Democracies", at http://www.worldvaluessurvey.org/.

environment. Mammals, on the other hand, were more flexible and flourished once the dinosaurs were gone. Another example in this genre is transportation companies that defined themselves as exclusively railroads as other means of transportation evolved.

On the other hand, SOSs that are moving toward chaos sometimes also lose touch with their environment and are also eliminated. Cancer is an example. It multiplies wildly, often killing its host and hence itself. Current human activity on Earth is aptly compared to this in some ways.

The SOSs that survive long term are those that drift back and forth between stasis and chaos. Creative bursts in biological evolution are usually caused by a step toward, or into, chaos that disorders the system - loosens it up - and from that disorder a new, higher form of order, emerges. Human culture has evolved in much the same way. For example, some scholars see the development of modern democracy as a creative response to the rising human consciousness (and hence energy) in Europe that resulted from the printing press and other social forces. This increased disorder (or caused chaos) as the Divine Right of Kings and Papal and other forms of authority were called into question.

Mythology of all kinds celebrates the dip into chaos, testifying to the importance of this phenomenon in human history. The Arthurian legends and the need to enter to "dark forest" in pursuit of the Grail and its mystic power exemplify this. Think of Adam and Eve leaving the Garden, Jonah and the Whale, many of the Greek myths, etc. Joseph Campbell's book "The Hero with a Thousand Faces" shows how common the descent into chaos theme is.

It is helpful to think both of our personal evolution (that some speak of this in spiritual terms) as well as the evolution of social groups using the SOS paradigm.

Human beings and groups that excessively insulate themselves from their environment tend to drift toward stasis. Some of the most seemingly successful kill themselves in sense through this process. Consider the Shakers (see http://en.wikipedia.org/wiki/Shakers) who came into being not long before Mormonism. They thrived despite their doctrine of celibacy during a time when government social services were non-existent and the supportive community they offered performed a crucial role in many lives. As the dominant social ethic changed and publicly funded social services increased, they failed to attract new converts and since they did not reproduce, the Shaker movement collapsed. I think something similar will likely be said in the future about the Fundamentalist Mormons. And the recent experiment with command economies and a particular form of communism is more of the same. Insulated top down control often causes an inability to evolve that is deadly to social organisms.

The best way to ensure a drift toward stasis and death is to eliminate feedback mechanisms (heresy, for example) that contradict the dominant current in a social group. The best way to ensure a healthy society is to seek the SOS balance between order and chaos. Measuring this in social groups is problematic, and the agent based simulation models now being used for this purpose provide some of the best tools so far to illustrate the principles on which SOS can operate in a social context.[89]

Many examples of similar phenomena can also be found in nature. Our decision to eliminate small forest fires, for example, eventually produced the conditions for cataclysmic forest fires we

[89] See Joshua Epstein, See Joshua Epstein's thoughts on this topic at http://www.econ.iastate.edu/tesfatsi/Epstein.ABMIntro.pdf#search=%22%22joshua%20epstein%22%20brookings%20agents%22, and http://www.pupress.princeton.edu/titles/8277.html.

cannot control and that do immense ecological damage, such as sterilizing the seed bed in the soil from which the forest habitually regenerated after its regular "pruning" by smaller fires. Avalanches of various kinds exhibit similar characteristics. What do we prefer, a series of small avalanches that can perhaps be managed or the rare, and immensely destructive, huge avalanche? Studies related to traffic control notes the same tendency – too much effort to control traffic may reduce small traffic jams, but will increase the probability of the occasional immense problem.

Social organizations that attempt to prevent change for dogmatic reasons are in many ways like the well-intentioned forest rangers who were successful in their goal to put all fires out by the morning after they started. This seemed in the best interest of the forest and those who depend on it, but produced disaster because the rangers did not understand the healthy, transformative effect of naturally occurring forest fires. They were renewing bits of chaos in the forest ecological system.

I suggest that what is perceived as heresy in many religious groups is analogous to this. Joseph Campbell, in fact, referred to heresy as the "life blood" of religious institutions because it functions as a kind of external nervous system, alerting the religious organism to important issues that it would not have spotted on its own as a result of its inward looking nature.

A good social example of a dip into chaos that caused renewal is found in the Mennonite tradition which has evolved from being like the Order Amish to embrace a wide range of different groups, a few of which are at the liberal protestant end of the religious and political spectra. The Reorganized Church of Jesus Christ of Latter-day Saints (recently renamed “The Community of Christ”) can be analyzed in similar terms. Or how about Mormonism when polygamy was forcefully taken from it after years of prophetic deception (see http://lds-mormon.com/sc.shtml). Had that not occurred, Mormonism could not have gone mainstream and international as it did. A jolt of chaos made Mormonism what it is today.

Our democratic institutions have evolved significantly and continue to do so through what is an undeniably, and at times disturbingly, chaotic process. This chaos has been institutionalized within and is hence controlled by the electoral process and the representational democracy that flows from it. However, as society becomes more global and the degree of environmental and social changes accelerates, we are likely to have to evolve radically new social structures that will span nations and limit sovereignty to a degree. It is an open, and crucially important question, as to whether we will be able to do this in time to restrain phenomena like runaway population growth and the use of limited sources by those who do not bear the full cost of this use. This is the case as much when either a tank of gasoline or tree in the Amazon jungle is burned.

And on a personal level, we are all familiar with the need to "shake things up", and how successful relationships and other aspects of our personal lives require a delicate balance of stability and change.

My suggestion is that some literalist religious groups have been drifting toward stasis for decades now. They have been trying to insulate themselves from disruptive information flows and social forces, and have been largely successful in this regard. So successful, in fact, that as information regarding the reality of literalist religious foundations is being rammed through ideological walls by the Internet, many feel a massive social shock either personally or as relationships rupture while family members find themselves unable to communicate across an ideological chasm that suddenly, and terrifyingly for many, opens beneath their feet.

So chaos is increasingly in the blood that runs through literalist religious social veins. This will cause change. The question is, what kind of change will it be? Will religious leaders continue to seek isolation, stasis and so inadvertently court social death, or will the religious organisms in question evolve. And if evolution, in what direction?

I expect to see extinction events as well as the emergence of new species.

SOSs and Intimate Relationships

Complexity theory offers some deep insight into intimate relationships that I am just starting to process. For example, human relationships produce qualia[90] of various kinds. These emergent phenomena are sometimes satisfying and other times deeply disturbing. Each potential relationship partner presents us with a different set of choices relative to the adjacent possibles we must give up (beliefs, behaviors, etc.) in order to function as part of the complex system that would be our relationship. That relationship would be unique, and would have a range of potential emergent properties. To optimize those, we must give up adjacent possibles as required to make the system function. If we don't do that, the system will fail unless the partners can modify sufficiently to make it function on different terms.

As we age, our ability to change becomes more limited, and truth be known, was likely never that great. The worst of all worlds is to give up some adjacent possibles but not enough to make a would be relationship function so that it can produce the emergent, intimate qualities most of us crave. In this state we are betwixt and between, neither hot nor cold. The New Testament God said he would spew such out of his mouth[91].

One of the basic lessons of complexity theory is that in deterministically chaotic systems[92], change occurs faster than the possible rate of computation. Therefore it would be impossible to predict with certainty the nature of the emergent properties of any relationship even if it were possible to understand all of the relationship factors and measure the data relative to them. However, we can predict to some degree the freedom we will have to give up to make a relationship work, and we can estimate a probability distribution of the potential emergent properties that are likely to be created by looking at other relationships that are similar to the one into which we are invited. Going through this exercise and thinking in complex systems terms, should improve our relationship decision-making.

As SOSs break down, the self-similar pattern that facilitates communication and co-ordinated behavior within the system breaks down. This is either because the system has gone into chaos or stasis. This is the same old story. Too much chaos means that one part of the system disconnects from the rest and the pattern of behavior that makes the relationship what it is breaks down. Think of what happens when one spouse changes radically. He was conservative and becomes liberal. He was religious and becomes atheist. He was faithful and becomes a libertine. He was risk averse and starts motorcycle racing and hang gliding. Etc. It would take an unusual partner to adapt to this.

[90] See http://en.wikipedia.org/wiki/Qualia.
[91] See Revelations 3:16.
[92] See http://134.184.131.111/CHAOS.html.

Too much order also often causes one part of the system to disconnect from the other. What happens, for example, when over the years one spouse does not change in any way while the other, and the rest of the environment, change dramatically?
John Gottman's work regarding relationships in this regard is seminal[93]. He is measuring breakdowns in the fractal relationship field without using that theoretical framework. For example, the hierarchical behavior Gottman identified as the most potent relationship killer (what he called "contempt" but is really something much more subtle than that, more like disrespect) can be viewed as the communication of the concept that one party to the relationship views himself as operating at a different and higher level than the other partner in the nested framework of complex systems that is all reality. That is, he is more like a system of which the other party is a subsidiary part than they are like two parts of a single system. Regrettably, Biblical and other metaphors in our patriarchal culture supports this idea by suggesting that the woman is part of the man[94]. And Gottman's research shows that this is a two-way gender street. From a purely pragmatic point of view, it is now clear that ideas of this kind are toxic to relationships except those that are based on the kind of hierarchy Gottman says kills most North American marriages. In some traditional cultures, this kind of relationship is still standard operating procedure.

It also occurs to me that the mirroring studies most of us are familiar with in the human context (and that Barb Smuts nicely illustrated in her Star Island presentation apply to animals as well), are consistent with this conceptual approach to relationships. And it is another behavioral vector Gottman tracks. Absence of mirroring (when you tilt your head, I tilt mine the same way; when you smile, I smile; etc.) is a sure sign of disagreement on the point under discussion. The consistent absence of mirroring is a sign of intimate relationship distress, and usually indicates the presence of the kind of disrespect/contempt Gottman identifies as the relationship killer.

It may be more than mere metaphor to think of this kind of communications breakdown between intimate partners as the dissolution of a fractal system of information, values, behaviors, etc. that support intimate relationships. Likewise, a similar breakdown within a religious institution would be a good indicator that major change within that system is on the way.

I should note that self similarity does not mean identity or anything close to it. Many of the best relationship combinations are likely to differ radically from each other while being complementary or resonant in some ways and providing important negative feedback in others. For example, people who hold the same general worldview but approach it from radically different points of view (the scientific v. the artistic, for eg.) are likely to have reasons to deeply respect each others' talents. On the other hand, it is well known that relationships that attempt to bridge significant religious or cultural differences are difficult. A master's degree thesis project found an 80% divorce rate in a large Mormon population where one party stopped believing and obeying religious authority while the other continued. I recently read reference to another study that showed a large jump in the probability of divorce or relationship breakdown after near death experiences because these often produce fundamental changes in values.

---

[93] See http://www.helpguide.org/mental/improve_relationships.htm and http://www.soc.ucsb.edu/sexinfo/?article=communication&refid=021 for summaries of John Gottman's work on marriage relationships, and see my comments re. same starting at page 9 of http://mccue.cc/bob/documents/rs.a%20few%20thoughts%20about%20Mormon%20Marriage.pdf.

[94] Eve coming from Adam's rib; the man caring for the woman as Christ cares for the Church; etc.

An noted above, negative feedback is important to maintaining relationships. Spendthrifts tend not to do well together. Depressed people tend to further depress each other. And Pollyannas tend to make poor pairs too. We of course evolve (to an extent) toward the niches in relationships that are suited to us and required in order for the relationships to function. One (or both) of the spendthrifts may change, for example, after some painful experience.

Back to the basic lesson of SOSs - too much order (the giving up of too much of the adjacent possible) kills us and too much chaos (the availability of too many adjacent possibles) does the same. Open relationships work for some people, but in many cases may cause failure as a result of too much adjacent possible, for example. And what often happens to a marriage where the parties become so involved in their own professional, social, etc. lives that they seldom see each other? Relationship failure in this regard can be seen as the result of an inadequate pruning of the adjacent possible. And what is too much or too little adjacent possible is a function of the environment from time to time.

Eventually it is my bet that people will take Gottman's and other similar work and will format it into an SOSs framework, and then allow people to take tests that will give some insight into the kinds of degrees of freedom they should expect to give up to make a relationship between them work, and what kind of potential that relationship has. The question to ask about this kind of analysis is not whether it produces "truth", but rather whether it adds to our insight into self, other and relationship potential. Given Gottman's stunning record of predicting divorce with 95% accuracy based mostly on non-verbal, unconscious communication, it is reasonable to continue down the path he has blazed.

SOSs and Social Phase Transitions

Philip Ball's[95] "Critical Mass"[96] is a fine book about complexity theory. He uses this paradigm to explain why it was reasonable to expect human groups to suddenly change their characteristics on the basis of a phase transition similar to what happens when a liquid starts to boil.

Different human groups will react in different ways to environmental changes due in large measure to how information or energy flows within them. Something analogous occurs within each human brain. Ball uses the analogy of grains of sand being added to a pile and occasionally starting avalanches of different sizes. Avalanches will occur as the pile grows larger. That is how the pile deals with the energy created by grains being added at the top of the pile. A probability distribution can be created (if you know enough about the nature of the sand grains in question and how they are added to the pile) in terms of the size of the avalanches that are likely to occur. The smoother the grains, the more and smaller on average will be the avalanches. But occasionally there will be a big one. The more angular and fissured the grains, the fewer the avalanches there will be and the larger their average size.

Large avalanches at the individual level are analogous to what happens to people like me within rigid traditions like Mormonism: the sand gets piled very high, and so some of the grains roll a long way once they break loose.

At the group level, large avalanches represent the collapse or complete restructuring of a group. Smaller avalanches represent change of a type that most group members simply accept. Those

[95] See http://en.wikipedia.org/wiki/Philip_Ball.

[96] See http://books.guardian.co.uk/reviews/politicsphilosophyandsociety/0,6121,1178982,00.html for a review.

who manage mountain areas that are part of recreational or industrial uses tend to trigger snow slides on a regular basis so as to avoid huge, unexpected slides. This is similar to how democracy works – it has institutionalized a controlled kind of chaos around the electoral process and at other crucial system junctures that encourages change to regularly occur in manageable increments. This is an attempt to avoid revolution – the social equivalent of a destructive landslide or forest fire.

As noted above, another phenomenon that illustrates the landslide principle is forest fires. The radical reduction in small forest fires due to the diligence of the various forest services around the world created heavy undergrowth and eventually produced huge fires.

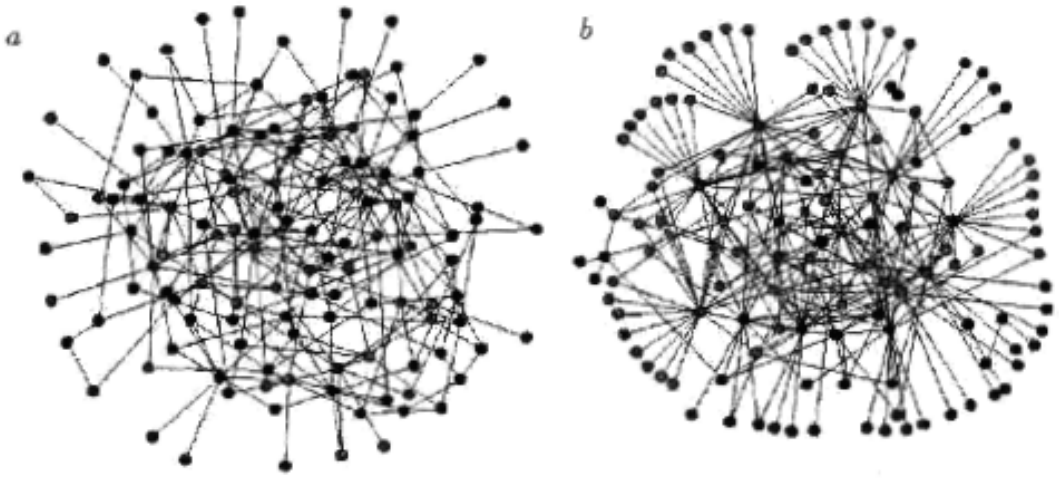
Something similar is observed in traffic control studies. It is possible to regulate traffic flows so carefully that most small traffic jams are eliminated. But this careful calibration means that when a traffic jam does occur, it will tend to be enormous. The very controls that enable regulation of small events create the conditions for catastrophe.

Economic studies are producing similar insights. It appears likely that too strenuous attempts to avoid recession will increase the probability of occasional, severe, depressions.

Human brains and many types of social groups have been shown to operate on the basis just described. Those who attempt to carefully regulate the small changes by which social groups tend to evolve increase the risk of huge phase transition events that may destroy the very thing the well intended regulators seek to protect.

Ball went on to show how we tend to overestimate the importance of our individual psychology and “free will”, and underestimate the extent to which our lives are influenced by how we in effect “bounce off” other individuals.

The sand pile, forest fire, traffic, economic and political examples demonstrate SOS vulnerability to cascades. This is a function of the key distribution nodes that exist in these systems. Consider the difference, for example, of the two diagrams below. The one on the left is random, and the one on the right is SOS.



16.3 Random graphs (*a*) are rather homogeneous, whereas scale-free networks (*b*) seem to be "pinched" at a few highly connected vertices.

Notice the nodes in the SOS system (on the right) that are obviously more important than the rest. Here is how Philip Ball describes these systems[97]:

> "Perhaps the deepest principle of life is metabolism: the conversion of raw materials from the environment into the energy and the molecules that cells need every moment of their existence. Cells need access to a variety of building blocks: our own cells, for example, are supplied with amino acids, sugars, and lipids from food, as well as vitamins and mineral nutrients, water, oxygen, and other essential substances. They use enzymes to rearrange the atoms in these molecules to form new enzymes, nucleic acids, hormones, energy-rich molecules, and so forth. The sequence by which a raw material is converted into a useful molecular form is called a metabolic pathway.
>
> Almost without exception, these pathways are not linear but branched and interlinked. A single raw material such as glucose is reconfigured or fragmented in many different ways. The energy-rich molecules made during the breakdown of this sugar are used to power many other metabolic processes. So metabolism defines a large network of chemical reactions in which particular molecular substances can be treated as nodes, and reactions (usually catalyzed by enzymes) can be considered as edges that link one node to another.
>
> Barabasi and his colleagues looked at the metabolic networks of forty-three different organisms ranging from bacteria to plants to "higher" life forms like the nematode worm. They found that the connectivity distribution function in every case was scale free [that is, SOS]: the probability of a node having a certain number of links followed a power law. This implies there are a few highly connected "hubs" in the network that play a crucial role in holding the web together. Many of the molecules representing these hubs, and their relative importance in the network, are the same for all organisms - a reflection of the life's common evolutionary origins.

[97] See "Critical Mass" at pp. 389-391.

> The scale-free structure of metabolic networks makes sound evolutionary sense, because it makes metabolism relatively insensitive to a small incidence of random failures. If one or two enzymes are defective, perhaps due to a genetic defect, this weakens or even severs the corresponding edge in the graph. While this can have harmful consequences for certain biological functions, it need not, in a scale-free network, break up the whole web and make life impossible. Thus we can regard the scale-free network as an example of good 'engineering' wrought by the trial-and-error exploration of options that is natural selection."

After describing how the "key node" feature of SOSs makes them surprisingly robust when under random attack, Ball goes on to tell us that[98]:

> "On the other hand, the weakness of scale-free networks is their sensitivity to planned attack. If the hub nodes are removed, the network rapidly falls apart. This suggests opportunities for the inventive design of drugs to combat bacterial infection[99]. Drugs that interfere with the most highly connected molecules will have a disproportionate effect on the viability of the attacked cells. Understanding the network structure would be a first step toward selecting appropriate targets. In this scenario we are the "cyto-terrorists," and our intentions are, from a human perspective, purely benign. …
>
> Barabasi points out how systems such as the power grid are prone to cascades of failure where a malfunction at one point shifts power to other lines, leading to an escalation of overloading. 'Cascading failures are common in most complex networks,' he says. 'While celebrating that everybody on Earth is only six handshakes from us, we need to accept that so are their problems and vulnerabilities.'"

Think of the literalist religious communities that operate on the basis of shunning. This is an effort to control the flow of information and hence determine where the important communications nodes will be. Hence, all potentially competing communications nodes must be knocked out.

Think of the various apologist organizations for literalist religion, or ideological efforts like that related to Intelligent Design[100]. FARMS[101] and FAIR[102] are Mormonism's primary apologetic organizations. They are essentially fog machines in the finest post-modern tradition whose purpose is to reduce the influence of potentially dangerous information nodes that the institution cannot control and might, if left unattended, produce a phase transition causing cascade. So the apologists produce noise in the system that will obscure all signals that may compete for authority with institutional leaders hence reducing the probability that information transmission will cause change. Confusion works in favor of conservative forces.

And, just as is the case when fighting a potential epidemic in an SOS network, all one has to do is keep the spread of disease ("bad" information) below the critical point to prevent a phase transition. Hence, in many fundamentalist organizations we find the rule that no one should communicate about anything that questions institutional authority.

---

[98] See "Critical Mass", at page 391.
[99] These use an SOS structure.
[100] See http://en.wikipedia.org/wiki/Intelligent_design.
[101] See http://farms.byu.edu/.
[102] See http://www.fairlds.org/. As the name indicates, these people have no sense of irony.

These principles can be turned around for use by those who would change fundamentalist (or other) minds. People who remain nominally at least on the “inside” take on new importance. Anonymous internet bulletin boards become crucially important. Information that questions literalist religion on the basis of scientific principles in the newspapers, schools etc. becomes critically important because it is outside the control of the ideologues, and has an authority of a different kind (science) behind it.

Perhaps the most important issue may become the public declaration of belief by respected people and the reporting of this in the media. This kind of peer to peer influence has been shown to be powerfully influential in many contexts. Think, for example, of what would happen if there were a steady stream of respected, successful LDS men and women saying in public in city after city across North America, one after another, month after month, "We have not sinned; we have made the most careful prayerful decisions of our lives; and we have concluded that Joseph Smith and all of have inherited his authority have grotesquely misled us and abused our trust".

At present, these people are leaving Mormonism, but quietly. Several have told me lately that when they announced that they were leaving Mormonism to their immediate families, THE issue quickly became silence. It is one thing to leave, but if you announce your disbelief publicly that is a much more grave sin – that is an open rebellion against God and his Kingdom that will be punished in a much more severe fashion and it incidentally will embarrass your family. All the stops are pulled out on this issue to try to persuade the decamping Mormon to keep her mouth shut.

The more I study this the more uncanny the Mormon (and other) social defence systems seem to me. They must be the product of evolutionary forces as surely as those that produce life's metabolic processes:

Use Ball’s analysis to think through what sometimes happens as new and disturbing information entering a group. It would have little noticeable impact for a long time, and then finally one individual would experience a phase transition at the neural level. That is, enough neurons would fire in a new pattern, consistent with the new information, to change one mind. Then, that individual would interact with others and help to cause mental phase transitions in them, and as they did the same with other individuals a social avalanche of changing attitudes and behaviour would occur. This would abruptly release social or intellectual pressure that had built mostly unnoticed over a long period of time, just as avalanches release accumulated physical energy. Most avalanches would be small, and occasionally a landscape changing event would occur.

A social phase transition of this sort is likely what brought down the Berlin Wall and changed Eastern Europe in a few ticks of history’s clock.

The Mormon and other literalist information systems have few links between distant system parts, and far more that run through a central hub that controls information flows. What happens when the Internet – and SOS system – is suddenly laid on top of the literalists’ information network? Massive amounts of new information starts to flow through the system in a fashion that can’t be restrained by the central hub. As a result, there are many people currently inside literalist religious traditions whose faith is going to come under a great deal of pressure. That is, they will begin to question the direction in which large amounts of their energy have gone as a result of the priorities dictated by their social group. The research related to

cognitive dissonance[103] and other biasing factors speaks to how this will look and feel. These forces hold literalist belief systems together inside individual crania and social groups. As levels of cognitive dissonance rise within these religious groups relative to the point I just described, individual members and ministers will increasingly look for approaches at the fringes of their traditions that will enable this pressure to be relieved and/or contained.

Enter theologians and scientists who are “folders” of the type described above. My experience with this kind of person is typical in many ways. As long as I was a fully faithful Mormon the “folders” had zero appeal for me. My mind was compartmentalized. I was a rational, critical thinker regarding everything except religion, and used a magical belief system in that regard without knowing it. This is because I uncritically accepted a few unjustified premises. The leaders of the group went to great pains to keep the rickety foundations of those premises under wraps. Once I encountered solid information that questioned those premises, I went into a state of crisis. Then I needed the folders – the bridge builders – and quickly found their counterparts at the fringes of Mormonism.

Most Mormons who go through the process I did stop at the outskirts of their tradition. However, once a sled has broken out of the ice it is hard to predict where it will stop. The sand pile and other analogies above explain this.

The folders work at the fringes of religion and science (particularly ecology, I hope, as time passes) and help to weave what could become a global mythology. They also provide the basic materials from which many others will rationalize the conflict between their particular traditions and the scientific/rational worldview that is entering their groups in new ways.

Think of a Mormon teaching BYU, or an Adventist or Baptist minister whose congregants are increasingly troubled by the conflict between the scientific, secular worldview and their religious beliefs. These "defenders of the faith" read broadly in attempts to find ways to shore up the walls around the attractor basins that define their communities. They don't see it that way, however. They think that they are looking for "truth". But truth manifests itself to people of this type as whatever will work to preserve as much of their faith as possible. Their favorite philosophers tend to be like Heidegger[104] and Rorty[105]. And liberal theologians or new agey scientists who are criticized in some quarters for being so hard to pin down are for that very reason manna from heaven for those who defend the borders of various literalist religions. And so what was literal in these communities gradually metamorphs as far as an increasing percentage of the population is concerned. For most, this change will take generations.

Many bridges of different types need to be built in order to change our culture related to religious belief. The more literalist the believers, the more angular and fissured (and hence sticky) are their grains of sand. The radical Muslims are so extreme in this regard that we might call them Velcro grains. In certain times and places, this kind of sand grain and social group would have been highly adaptive. But not now, in our shrinking and increasingly interdependent world.

In these "sticky" cultures, sand piles grow very tall and avalanches are massive and destructive. We should place a high priority on encouraging forces within these sand piles as they grow that

[103] See http://en.wikipedia.org/wiki/Cognitive_dissonance.
[104] See http://en.wikipedia.org/wiki/Heidegger.
[105] See http://en.wikipedia.org/wiki/Richard_Rorty, http://www.cscs.umich.edu/~crshalizi/reviews/haack-manifesto/ and http://www.newcriterion.com/archive/16/nov97/menand.htm.

will knock edges of grains of sand, and most importantly, reform the conditions under which angular, fissured young grains are created. I see liberal theology and spiritually oriented science as potentially important in this regard.

Finally, SOSs are characterized by a pattern that includes a few highly influential nodes. Think of the Internet. Its central hubs both make it efficient and vulnerable to attack. Think of epidemiology. Certain molecular interactions have great influence. If enough of these (or even one in some cases) can be knocked out, an epidemic can be defeated and through inoculation, future epidemics avoided.

Malcolm Gladwell[106] uses the terms "mavens" and "salesmen" and "connectors" to describe the key players in social phase transitions. In the religious context, we should add those who are institutionally influential since some of them do not fit into Gladwell's categories.

To change religious institutions one needs to find the levers Gladwell has identified. They won't likely listen to those who are the most harshly critical of religion[107]. That means that those who get the science right and have the ear of these opinion shapers are extremely important folders. In the right doses, properly focused, they can both take significant, sticky edges off these people and far more importantly, cause them to change the very processes by which new grains of sand are formed within their cultures.

Within hours of reading Ball's account of how information systems work, I had lunch with a new post-Mormon friend who told me the following story.

He has been for years a metaphoric Mormon – skeptical of literalist Mormon claims and authority, but committed to his tribe and not anxious to rock a boat that would disturb his marriage, family relationships and friendships. In that situation, about two years ago, he was serving as a member of a bishopric[108] and had recently discovered post-Mormon oriented Internet bulletin boards and while not participating much, was doing a lot of reading on them.

One Saturday night he arrived home from a trip and decided to do a little catching up on his post-Mormon bulletin board reading, and ended up at a place called "The View from the Foyer"[109] and came across some posts by a fellow named "philo", the name under which I posted for the first few months of my Internet life. One string in particular caught his eye that dealt with the nature of Mormon marriage[110], and he became fascinated. At about 4 am he stopped reading, and was cursing philo as he went to bed knowing that in a couple of hours he would have to get up to start a full day of church meetings.

At church he went through the usual run of meetings, starting with Bishopric, Priesthood Executive Committee, and then the congregational meetings. Half way through, he was told that the man responsible for the Priesthood lesson had not been able to come and did not have a substitute. As the person in charge, he had to present a lesson. Since he had nothing prepared, and philo's odd take on Mormon marriage was still running through his mind, that is

---

[106] See "The Tipping Point", and http://www.gladwell.com/tippingpoint/tp_excerpt2.html.
[107] I have in mind here people like Richard Dawkins, Steven Weinberg, Daniel Dennett and Sam Harris.
[108] The group of three Mormon males who preside over a Mormon congregation. They are lay persons. Mormonism does not use a paid clergy at the congregational level.
[109] See http://www.aimoo.com/forum/freeboard.cfm?id=418550.
[110] See http://mccue.cc/bob/documents/temple%20marriage.pdf starting at page 36.

what he decided to present. So he told the assembled Mormon adult priesthood holders to put their lesson manuals away, and that they were going to talk about marriage.

As he started to present some odd sounding ideas, one of the older members of the group challenged him, and asked where he was getting his information. He said that he had found it on the Internet in some stuff a former Bishop had written. This led to a brief discussion about the merits and demerits of what is on the Internet, which he ended by indicating that nothing in books, on the internet, or elsewhere should be accepted without checking it carefully, and the information he was presenting was no different. It has to stand on its own merits, and the discussion they were having was part of that vetting process.

It did not take long for the group to be fully involved in a discussion about the pros and cons of the Mormon conception of Celestial marriage and its extreme orientation toward benefits in the future (after death) in exchange for current sacrifice[111]. He told me that this kind of vigorous discussion was unheard of in this group, and that at the end of the class a number of people thanked him for presenting such a useful lesson, and said it was the best they could remember hearing in that context.

This story illustrates the difference between communication networks that are organized along SOS lines, and those that do not have enough of the long links that characterize this structure as described above. The long links are what make rapid distribution of information possible, and so facilitate change.

The Mormon information system has not had many of these links. As already noted, Mormons tend to have smaller and less diverse personal connections than others. And they tend to have access to less information that questions their point of view than do similarly educated non-Mormons. Enter the Internet. It is organized along SOS lines, and as Mormons and other literalist religious people plug into that, phase transitions suddenly become possible within that community.

So, my new friend, as a participating Mormon in a leadership position, becomes a long link. With a few mouse clicks he finds some ideas in the head of a now apostate, former Mormon Bishop, finds them appealing, dresses them up a bit, and spikes them straight into the middle of a Mormon congregation where they are enthusiastically received. This largely circumvents the elaborate system the Mormon institution uses to ferret out disturbing forces and neuter them. This is why I was told that I either had to stop communicating with anyone outside my family about ideas that questioned Mormon authority, or resign my membership. In the former case, I would not spread dangerous ideas. In the latter, I would be viewed as a sinner who had lost God's spirit and hence anything I had to say would be ignored by the faithful.

The internet makes it far more difficult for the "cancers" Mormon leaders fear to be eliminated. This means that chaos and its renewing force is far more likely to be felt within the Mormon body than it used to be. And far from cancerous, this change is likely to restore circulation to a near moribund body.

[111] See http://mccue.cc/bob/documents/future%20orientation.pdf and http://mccue.cc/bob/marriage.htm.

SOSs and Mimetic Behavior

Larry Iannaccone's application of rational choice theory[112] to religion in general is in the process of bearing a lot of fruit. In particular, his model of religious preference and religious or social capital is helpful in a variety of ways when thinking about religion[113], and can be used in conjunction with SOS theory to both better understand what we experience and form hypotheses for further investigations.

Iannaccone notes, for example[114], that there are different proportions of religious and irreligious people on coasts v. interior and south of the US. And, while there is lots of migration between regions but proportion does not change, therefore religious behavior is changing as people move. The key factor in this regard appears to be the behavior of the few other people closest to a person. This was evident through the usual regression analysis economists use. Iannaccone used an agent simulation model to illustrate how a small increase in the factor for social influence could explain the data.

Similar patterns of long term stability in religious behavior by region found in Europe and elsewhere[115]. But Mormon behavioural patterns seem to contradict this. This is likely because Mormonism is more homogenous and portable than most religions. That is, similar Mormon congregations exist in most US cities, leading to the derisory term "McMormonism". Mormonism uses a centralized membership tracking system and the assigned "friends" to further strengthen its system for people who move from place to place.

The insight from these studies is that the religious and other behaviour of our few closest associates is a strong behavioural attractor. That is, humans are highly mimetic. Religious and other social groups that are organized to take advantage of this human trait will tend to do better than others in the short term at least, whether that is good for individual members of those groups or not. This explains the tendency of members of religious and other cultural groups to group together.

And conversely, as pluralistic[116] points of view become more common, this will make it harder for steep, deep religious attractor basins to form or persist.

SOSs and Social Capital

Social grouping facilitates the creation of social capital.

Iannaccone also notes that "high cost" religious groups, like Mormonism and the Jehovah's witnesses, are growing more rapidly than most other groups. Evangelicals are mixed in this regard.

---

[112] See http://en.wikipedia.org/wiki/Rational_choice.

[113] See http://www.metanexus.net/spiritual_capital/pdf/review.pdf#search=%22iannaccone%20%22religious%20capital%22%22, http://www.religionomics.com/erel/S2-Archives/Iannaccone%20-%20Religious%20Extremism%20Origins%20and%20Consequences.pdf and http://www.religionomics.com/erel/S2-Archives/Iannaccone%20-%20JW%20Growth.pdf.

[114] See http://mason.gmu.edu/~mmakowsk/AccidentalAtheist.pdf#search=%22accidental%20atheists%22.

[115] See http://www.religionomics.com/erel/S2-Archives/Iannaccone%20-%20Looking%20Backward.pdf.

[116] See http://en.wikipedia.org/wiki/Pluralism. The opposite of pluralism is "monism", the view that there is only one "right" or "true" way to live or believe.

Why do high cost groups do relatively well while most low cost groups, like most of the traditional and mature religions, are losing members? Iannaccone hypothesizes that high cost groups weed out those who will not remain committed. This strengthens group as a whole and increases perceived benefits of membership. For small groups in particular, it is only necessary to capture a tiny percentage of the population to maintain high growth rates. Thus, clear definitional boundaries around the group and a relatively high cost of membership is likely adaptive from the organization's point of view, while regularly breaking up family and other relationships that attempt to operate across the clearly defined organizational lines.

A big part of the weight that holds social groups together by creating perceived benefits is related to the concept of social capital, which Iannaccone has called "spiritual capital" in the religious context. That is, by investing time in learning the organization ropes; its liturgy; its humans; by developing friendships within the organization; by developing status in the organization; etc. a non-portable asset is created. The greater this asset the less likely it will be that the person who possesses[117] it will leave the organization that gave rise to it. Hence, the more social capital a religion causes to be created the deeper its attractor basin will likely be.

However, if the cost or remaining in the organization is too high relative to the benefits perceived to be derived from membership, this could cause large scale defection. The trick appears to be to cause the create the perception of significant differences without raising real costs too high.

History matters in complex systems. For example, one of costs the Mormon Church must bear in mind as it charts its future course is that it has created in its membership a strong commitment to rationalism and integrity. Hence, a perceived breach of these standards would likely impose a high perceived cost on the average Mormon which might outweigh some of the benefits of relatively high cost, exclusive membership that Mormonism tries to create.

Likewise, Mormonism is strongly connected to most mainstream social values in terms of the use of technology, the value of science, the importance of education and democracy etc. Changes in the Mormon social system that would run against this grain would be perceived as imposing a high cost by most current members. Mormon leadership behavior is also constrained by these historical factors.

And finally, attractor basins are also to some extent a function of group age. Ant colonies demonstrate this. The colonies themselves have life cycles of over a decade. When members of a young colony run into each other they generally fight. When members of mature colonies encounter each other, they seem to simply nod and continue on their ways. This might be a simple function of group learning – fighting costs more than it produces. See the analysis of human compassion below for a large scale consideration of the same issue.

Human groups, like religions, have similar attributes. The Mormons and other relatively young religions are aggressive missionaries while the older faiths are more laid back. Hence we can predict in general more conciliatory, less aggressive approach to group interaction any particular group ages and comes into greater contact with other groups. This gives us cause for long term hope in terms of the more aggressive branches of the Muslim faith. And, it may explain much of what Iannaccone has observed with regard to high cost religious faiths – that tend to be young and seem to find as they age and become more diverse that their cost – benefit equation changes.

[117] Or as can be the case with all property, is possessed by it.

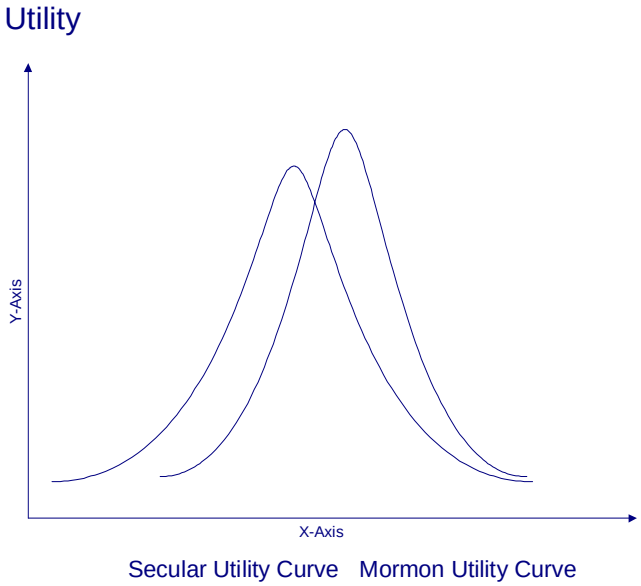
SOSs, Values, Utility[118] and Social Capital

Another way to think about social capital is through the use of "utility theory". That is, we are prepared to pay for what we perceive to be useful by giving up money, time and other things we value. The degree of usefulness – or utility – is determined by our beliefs as to what is real. For example, if I believe that my family and I will go to heaven and live forever in indescribable circumstances if I commit suicide while killing my people's enemies, there is a much higher chance that I will engage in that act of self sacrifice than if I believe the only thing at stake is which boss gives the orders I will have to take.

Religious and secular groups have widely divergent beliefs about what is real, and hence different utility functions. Another of Iannaccone's contributions to the understanding of religious behaviour relates to how these differences between the utility functions affect the behaviour of religious people who live at the same time in religious and secular cultures.

When we think about this in light of how SOS has us working with attractor basins in energy landscapes, it highlights what I noted above about how these landscapes are in some ways ridiculously simplified representations of reality. That is, the landscape attempts to capture the relationship between a human being and his religious group by simply showing where she is relative to an attractor basin of a particular shape. Is she at the bottom or near the edges; how deep is the basin; etc. Iannaccone helps us unpack this a bit by pointing us toward the way in which many religious people must ride to horses, and how the relationship between those horses hence is important.

For example, consider a religion that does not differ much from secular society. Its values and customs may have a distinction flavour of some kind, but in substance it is very similar to the mainstream of the society around it. Hence, the fundamental values that the perception of utility drive behavior in the secular culture and this religious culture are similar. Liberal Judaism and Christianity (including liberal Mormonism) are fairly described this way, and the relationship between religious and secular values in this context can be represented by the graph below:

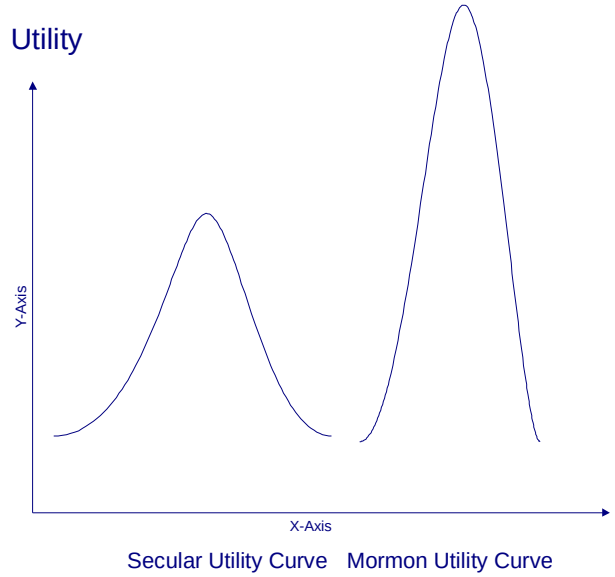


On this chart, the distance between the tops of the two curves indicates how different in objective fact the values in question are from each other, and the height of the curves indicates the perceived relative superiority of the religious system from the believers' point of view.

In the case depicted above, Iannaccone tells us, rational choice theory would predict that the religious person's behavior would likely gravitate toward where the two lines intersect so that she maximizes the utility she can derive from the two "worlds" in which she lives.

This relationship means that there is not a great deal of difference between the two worlds and hence the relatively little unique social capital will be created by the religious group and its attractor basin created will not be that deep. This would put it in the class of the liberal Christians, which means that people will tend to decamp with relative ease and frequency to other groups who have deeper attractor basins. Studies have also shown that agnosticism or atheism tends to hold even fewer adherents across generations than any of the religious groups, indicating how shallow that attractor basin is and how likely it is that relationship and emotional factors will overcome intellectual positions. This suggests that until cohesive social groups form around secular values, the culture wars should be expected to continue to go in favor of the religious groups.

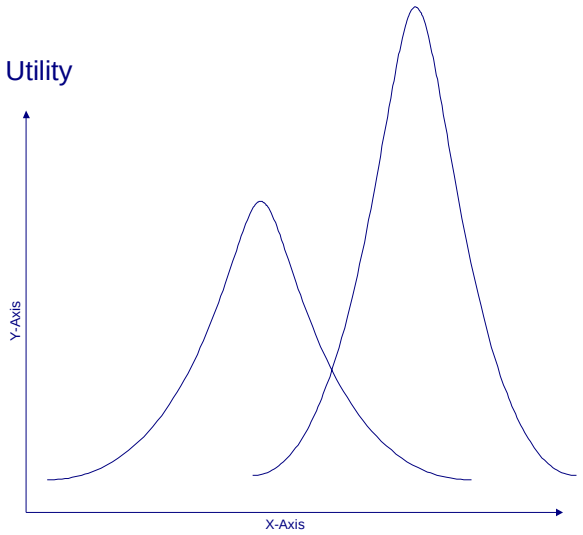
Let's now consider another example. What if the religion in question is radically different from the secular culture that surrounds it. This would be the case with literalist religions of many types, including the fundamentalist Mormons now and mainstream Mormonism 100 years ago. Here is how this relationship could be depicted.



[118] See http://en.wikipedia.org/wiki/Utility.

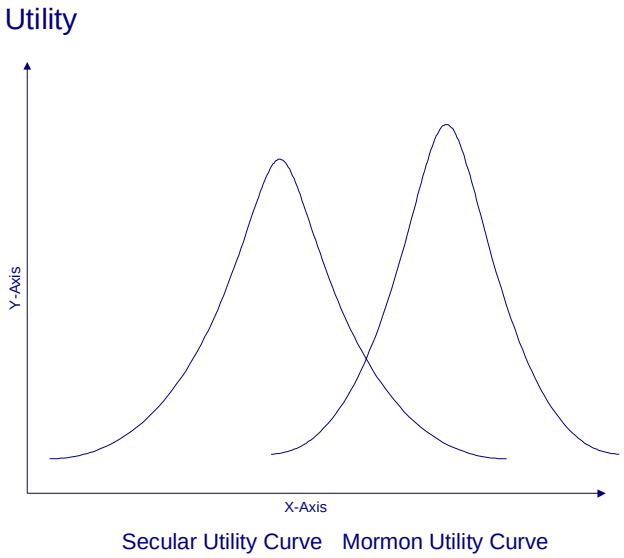
This is the “We are really different, and really better, than you” model. This forces members to choose between the two world and live almost completely in one. Think of the Old Order Amish, for example.

What happens as these worlds move a bit closer to each other, as shown below.



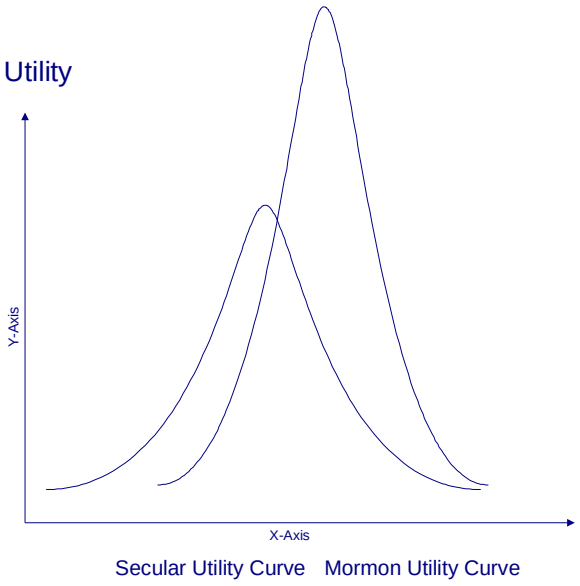
As literalists learn more about other religions, they see more similarities but may also continue to perceive a large difference in terms of utility. This is what has happened to innumerable one-time radical sets, like the Mormons. For example, as non-Mormons moved into Utah during the late 1800s this began to occur within the Mormon community and that continues to this day. The point at which the two curves overlap indicate that there is still a huge cost to be paid by those who move to the edges of the religious system, but do not leave it, as they try to take advantage of secular life.

And as the diagram below illustrates, it does not help much as the perceived utility of the religious life comes down relative to that of the secular life. Those who wish to remain in both systems are stuck in a place that can be counted on to produce lots of cognitive dissonance.



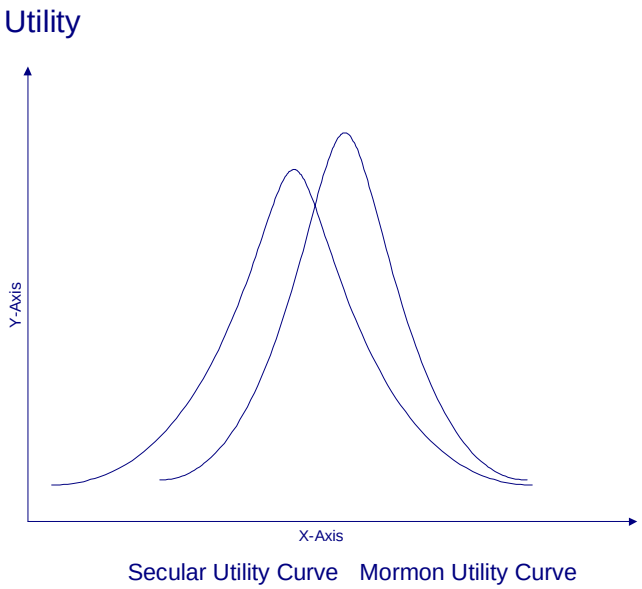
So, as long as the gap between the two groups is too wide, it is unlikely that people will try to play both sides.

What about the situation shown just below.



This is a risky position for the religious organism. It has established very high perceived utility without much difference in fact from the secular culture. If the basis for that perception comes undone, many people will perceive that as a loss and may defect on that basis alone. The Internet has dramatically increased the risk that this may occur as more people learn about the foundational problems of their faith and realize that most religions operate on the basis of similar values.

It seems clear to me that from a global social point of view, it will be healthy for religious groups to gravitate toward the kind of relationship to society, and relatively shallow attractor basins, that are illustrated below.



However, this means that individual religious groups will lose power and hence can be counted on to resist this trend just as the Catholic Church resisted the forces that reduced the size and depth of its once massive attractor basin.

The space that is left open in this case for religious groups would be like the one occupied by David Oler and his group of Jewish synagogues[119]. That is, there is not much difference in objective utility, but I wish to remain within "my tradition" and enjoy its unique aesthetic experience and meanings. This creates enough utility to keep a religious group together. This is consistent with the "evaporation of creed" trend mentioned above with many faith traditions. I think this is healthy since it will cause the orientation of energy within a religious group toward the same kind of thing that creates secular utility, such as averting the KKR Emergency.

SOSs and "Restorying"

We can tie together a number of concepts related to social capital and utility theory by thinking about the role narratives or personal mythologies play in how we live our lives.

As noted above, we are prepared to pay in terms of giving up money, time and other things we value in exchange for experiences of different kinds – things we perceive to be useful. And the degree of usefulness – or utility – is determined by our beliefs as to what is real. These beliefs are generally captures in a grand narrative within which we perceive ourselves to be living. We don't perceive this to be a narrative. We perceive our lives to within a framework of what is real. Other people, however, would often consider our beliefs as to what is real to be laughable, and

[119] See http://www.exmormon.org/Why%20We%20Believe%20-%20The%20Edmonton%20Series.htm#_Toc136829240.

we would perceive theirs in the same way. Paul Ehrlich[120] captures this nicely with a story about the Inuit, as follows:

> "Some may consider today's Western religions to be an evolutionary advance from hunter-gatherer religions, but as with language, there is little basis for placing the religions of modern people on a scale from primitive to advanced. People tend to think of their own religion as the one true religion, of course, and adherents of the religions that have become 'organized' as societies have become more complex tend to look down on those of the hunter-gatherers. This was brought home to me during my Inuit summer. Father Rio was a Belgian Catholic Oblate missionary stationed at Coral Harbour in the Canadian Arctic, part of the 'the largest diocese on Earth.' He was also battling with a native Anglican priest for the souls of the local Inuit. Father Rio made great raisin wine, and I spend many a pleasant evening helping him consume it. It was 1952, and in his view the Inuit, with their 'simple' religion, were 'just like children.' The 'simple' Inuit religion was actually a form of animism based on a complex of spirits, ghosts, human and animal souls, and several major gods, employing shamans, numerous taboos, magic words, and the like. It was anything but simple. …
>
> Interestingly, Father Rio's contempt for the religion of the people whom he sought to serve and convert was reciprocated. Once, when I was taking a language lesson with Tommy Bruce and several other Inuit, the talk turned to the feud between the Anglican priest and Father Rio, which had become intense. Why, Tommy wanted to know, if their religion was based on loving one's neighbors, did the priests shoot at each other's dogs with shotguns? Then he said, 'Do you know what Father Rio believes?' and regaled me with the story of the virgin birth. By the time he had finished, all the Inuit were laughing so hard that tears were running down their cheeks."

Our ideas about what is real are generally passed down to us by those we trust the most. Some of this comes to us during our formal education, but much of it (and often the most important parts) come to us from our families. It is there, generally speaking, that we learn about God, an afterlife, etc. and many of us accept without serious question the reality of these entities (god, spirits, angels, etc.) and events (rewards and punishments to be delivered both during life and after death on the basis of obedience or disobedience to God's commandments).

This reality is always framed as a story. Ancient mythologies worked this way, and our modern mythologies are no different, even those based to one degree or another on the scientific account of what is real.

The Diagnostic and Statistical Manual, version IV[121] is the manual currently used by psychiatrists to diagnose their patients. It provides perspective with regard to the causes, and recommended treatment, of certain religious or spiritual problems[122], and uses a narrative framework for this purpose.

As noted above, we conceptualize ourselves by way of stories and the role we play within them. This aspect of ourselves is referred to as the "narrative self", and the story in which we see ourselves playing a role can be called our "personal mythology". In order to have sound mental

[120] See "Human Natures" at pp. 219-220.
[121] See http://en.wikipedia.org/wiki/DSM-IV
[122] See http://www.spiritualcompetency.com/jhpseart.html for a summary.

health, it is essential that we feel secure within a personal mythology. It is through our role within this mythology that we perceive meaning in our lives.

A disruption of one's personal mythology related to religion can cause a form of mental dysfunction that is dealt with by the DSM – IV through a disorder known as "Religious or Spiritual Problem". This includes distressing experiences that involve loss or questioning of faith, problems associated with conversion to a new faith, or questioning of other spiritual values which may not necessarily be related to an organized church or religious institution.

For example, if my personal mythology is derived from Mormonism, I likely perceive myself as doing God's work here on earth and making many sacrifices in order to do so, and in exchange I am earning wonderful blessings that will mostly come to me and my family after death in the Celestial Kingdom[123]. I perceive the world as dominated by unseen forces of good and evil that are locked in an eternal struggle, and through my action or inaction, good or sinful acts, etc. I can either harness the forces of good through my priesthood and literally subject nature to my will (as long as it is consistent with God's will), or alternatively if I am not righteous I may fall under the influence of evil forces that can harm and deceive me in many ways.

If my belief in the reality of the entities and events that make this belief system work is shattered, I should be expected to feel somewhere between disoriented and suicidal. The DSM – IV provides the tools necessary for a psychiatrist to assess the degree of trauma likely to result from a mental dysfunction of the kind I just described has caused in a particular individual. And I note that this is only one of several kinds of spiritual problem that the DSM – IV identifies.

Dr. David Lukoff[124] describes the recovery process with regard to a spiritual trauma such as what should be expected to result from leaving Mormonism. He says that this kind of recovery requires that we learn to "retell" our personal mythology. That is, in my case either my Mormon based beliefs regarding what is real must be stretched to become believable and hence workable again, or an entirely new mythology must be developed that will ground me again. I must find a version of reality that I can trust, develop a narrative around that[125], cast a part for myself in that narrative, and then grow new neural connections and likely a lot of new neurons[126] to be able to do what my new role requires of me.

For example, as a Mormon a lot of obedience was required of me and hence I did not have to make personal decisions about how to act in many circumstances. "The thinking has been done", as a Mormon leader infamously said, and so all I had to do was show up. All of the roles that seemed functional to me once my Mormon beliefs crumbled required much more autonomy of me. This is not the kind of behavioural change a person can simply will themselves to make, any more than I could get out of bed one day and decide that I would be an accomplished pianist without having ever played. Some skills take a lot of time and patience to develop.

This re-grounding and skill development process I just described gradually creates the stability that we need to make plans; to invest energy in relationships; etc. This is the same principle that causes capital to be invested in far greater amounts in societies that are stable and orderly

---

[123] See http://en.wikipedia.org/wiki/Celestial_Kingdom.

[124] See http://www.virtualcs.com/blackboard/lessons/lesson7.html and http://www.spiritualcompetency.com/jhpseart.html.

[125] This will often look a lot like my old narrative. We tend toward using as much of our inherited narratives as we can in this new context in order to cut down on the energy and time required to re-tool ourselves.

[126] See Quartz and Sejnowski, "Liars, Lovers and Heroes".

than in those that are chaotic. If I think that my savings are likely to be taken from me by the big guy in town, I won't let him know I have them and hence won't invest in my farm, or a factory, etc.

Likewise, if I don't know what is coming in my personal future, I will have a hard time convincing myself that the investment of personal energy required to build relationships makes sense. And our perception of stability depends upon our belief in some version of reality. Little stability; few relationships. We are small herd animals. Hence, evolution has ill-equipped most of us to get along on our own.

Lukoff suggests that the best way for most people to deal with the process I have described is to engage in a lot of self expression. Ideally, a therapist who understands the process would be found and a lot of time would be spent allowing the patient to tell the old narrative, explain why it does not work; talk about hopes; dreams and fears; talk about new sources of information that are being ingested as the therapy proceeds; write about this in a journal and other formats if this is helpful[127]; and from all of this reading, talking, writing, thinking, etc. a new personal mythology will eventually emerge, and as time passes, stabilize.

Here is how Lukoff puts it in part:

> "Psychotherapy can be seen as a process of helping clients construct a new narrative, a fresh story of their lives. In this narrative understanding, psychotherapy does not consist in the cathartic healing effect of releasing traumatic repressed events and their emotions, but in reconstructing a person's authentic story. In making interpretations, the therapist retells the patient's stories, and these retellings progressively influence [the] what and how of the stories told by patient. The end product of this interweaving of texts is a radically new, jointly authored story. Or as Hillman describes it, the client comes to therapy to be "restoryed": 'The patient is in search of a new story, or of reconnecting with her old one. . . .The story needed to be doctored, not her.'"[128]

Later in the same article, Lukoff provides the following description of a particular kind of spiritual problem that will sound familiar to many post-Mormons:

> "Persons transitioning from the "culture of embeddedness" with their teachers into more independent functioning often seek psychotherapeutic help (Bogart, 1992). Vaughan (1987) reports that many individuals who have left destructive spiritual teachers reported that the experience ultimately contributed to their wisdom and maturity through meeting the challenge of restoring their integrity. One such case was described by Bogart (1992):
>
> 'Robert had spent 8 years as the disciple of a teacher from an Asian tradition that emphasized surrender and obedience. Robert had become one of the teacher's attendants, and reported that he "Loved the teacher very much." Yet there were difficulties. … Robert left the community after the guru's sexual and financial misconduct were revealed. Upon leaving, he had intense and at times even paralyzing feelings of betrayal, anger, fear, worthlessness and guilt.
>
> Robert went into psychotherapy with a spiritually sensitive therapist. Later in psychotherapy, he realized that his relationship with the guru replicated his relationship

[127] My self administered therapy was largely this – reading and then writing about my ideas as they formed.
[128] See http://www.spiritualcompetency.com/jhpseart.html at pp. 17-18.

with his father--an angry alcoholic who had humiliated and physically injured Robert, but whose approval he had nevertheless sought. He also worked on major issues around establishing a life outside the structure of the spiritual community and integrating his spiritual beliefs and practices into this new life."[129]

And finally, Lukoff distinguishes between emergencies and the process of spiritual emergence that many people undergo as their religious beliefs change:

> "In spiritual emergence, (another term from the transpersonal psychology literature), there is a gradual unfoldment of spiritual potential with minimal disruption in psychological/social/occupational functioning, whereas in spiritual emergency there is significant abrupt disruption in psychological/social/occupational functioning. The Benedictine monk, Brother David Steindl-Rast, describes the process:
>
> 'Spiritual emergence is a kind of birth pang in which you yourself go through to a fuller life, a deeper life, in which some areas in your life that were not yet encompassed by this fullness of life are now integrated or called to be integrated or challenged to be integrated (cited in Bragdon, 1994, p. 18). While less disruptive than spiritual emergencies, emergence can also lead persons to seek out a therapist to help integrate their new spiritual experiences (Grof, 1993).'"

I believe that I suffered a spiritual emergency when I discarded my Mormon beliefs. I could think and speak of little else for months. My work suffered. My family life suffered. Etc. Another DSM – IV category that is relevant to this process is posttraumatic stress disorder. Many recovering Mormons show many of the symptoms that define this disorder.

Here is what Lukoff has to say about dealing with the "emergency" aspect of this process:

> "However, for spiritual emergencies, most of the models of intervention come from the transpersonal psychology literature. Grof and Grof (1990) recommend that the person temporarily discontinue active inner exploration and all forms of spiritual practice, change their diet to include more "grounding foods" (such as red meat), become involved in very simple grounding activities (such as gardening), engage in regular light exercise (such as walking), and use expressive arts (such as drawing, clay and evocative music) to allow the expression of emotions and experiences through color, forms, sound and movement. In the case described above, Kornfield made use of most of these elements to avoid hospitalizing the individual who entered a spiritual emergency during a meditation retreat. Reliance on the client's self-healing capacities is one of the main principles that guides transpersonal treatment of spiritual emergencies (Perry, 1974; Watson, 1994). In addition, psychologists should be willing to consult, work closely with or even refer to spiritual teachers who may have considerably more expertise in the specific types of crises associated with a given spiritual practice or tradition. Unfortunately mental health professionals rarely consult with religious professionals or spiritual teachers even when dealing religious and spiritual issues (Larson, Hohmann, Kessler, Meador, Boyd, & McSherry, 1988).
>
> Another key component of treatment of spiritual emergencies is normalization of and education about the experience. While this is a common technique in therapy, it plays an especially important role with spiritual emergencies because persons in the midst of

[129] See pp. 4-5, 16-17.

> spiritual emergencies are often afraid that the unusual nature of their experiences indicates that they are "going crazy" (as described in some of the above cases). An extremely abbreviated version of normalization of an unusual spiritual experience is reported by Jung (1964) in the following case: 'I vividly recall the case of a professor who had a sudden vision and thought he was insane. He came to see me in a state of complete panic. I simply took a 400-year-old book from the shelf and showed him an old woodcut depicting his very vision. "There's no reason for you to believe that you're insane," I said to him. "They knew about your vision 400 years ago." Whereupon he sat down entirely deflated, but once more normal.' (p. 69)"

I first note the "normalization" point. That is what brings many people on their way out of literalist religion to places like the "Recovery from Mormonism" (RMF) bulletin board[130]. They seek validation. That is why the storyboard at RFM is so powerful. Mormonism restricts its members from talking about the reality of their experience. The only expressions of belief that are permitted in public are those that support the institution, thus isolating and invalidating all who do not resonate with what is publicly stated. This, over time, causes one's real feelings to be suppressed and creates an inauthentic manner of relating to reality and other people that can itself cause various forms of psychoses.

However, Lukoff's suggestion for those in the initial stages of crisis was counter intuitive for me. He did not suggest digging in and figuring things out (as I tried to do), but rather withdrawing from direct contemplation of the problem to engage in what amount to strength building, healing exercises that would create a greater ability to both see and bear reality. I think this idea needs a little reworking to be useful from a Mormon point of view, and took a shot at doing that, as well as describe my resent experience with these modes of therapy, in another essay[131].

It seems clear that Lukoff is referring to people who have acknowledged that they have a problem, and so have sought out a therapist. The main problem on the way out of Mormonism or other literalist religions is that the organization has its hooks into us in so many different ways that it is not easy to get to the point at which one can look herself in the mirror and say, "I have been duped. What am I going to do about it?" A destructive act is required to get to that point. Until that extraordinarily painful destruction occurs, the "patient" will not acknowledge that she is ill and hence will not seek, or in most cases be prepared to accept, treatment. Places like RFM play an important role in providing the information that people on the fringes of Mormonism need to validate their feelings, destroy unjustified beliefs, and find sources of information to start to re-work their personal mythologies. This requires focus on the problem – precisely what Lukoff recommends we avoid while in an emergency state. I think that it is fair to say that the state of emergency – if it will become such – will not occur until a person has accepted that his most basic beliefs are false. So, I suggest that Lukoff's advice be followed as soon as the penny has fully and truly dropped. Until then, it is necessary that the focus be internal – on the issues required to falsify unjustified beliefs and particularly, those beliefs realities that enable religious authority to be able to control the believer's behavior.

My moment of truth is described at http://mccue.cc/bob/documents/rs.revelation.pdf. It is my belief that had I done what Lukoff recommends (disengaged from Mormon studies and began to explore my artistic side), it would have saved months of thrashing around and a lot of stress on some of my most important personal relationships.

---

[130] See www.exmormon.org.
[131] See http://mccue.cc/bob/documents/rs.art%20therapy%20for%20recovering%20mormons.pdf.

It is common for people emerging from literalist religions to go through what might be called an emergency, and then later settle into a period of emergence that may last for a long time. I hope my emergence never ends. Near the end of his life, the great artist Goya wrote "Aun aprendo" (Yet I learn) on one of his drawings. To this we may all aspire. My experience with the "emergence" side of this experience so far still seems like a miracle most days, after over four years.

By way of summary, developing artistic skills[132] has powerful therapeutic benefits for those who are recovering from the effects of a domineering institution like Mormonism and are trying to develop a new personal mythology or worldview. And I can see particular wisdom in pulling away from the analysis of the "religious problem" in one's life once the crisis has been reached and we have accepted that our belief system is in disarray. At that point, as we begin to develop a new worldview, it is more important than ever that we perceive things accurately, as wholes, and in their essences, instead of in booming, buzzing detail. The disciplines of drawing, painting and creative writing as I experienced them in different ways suppressed my tendency to see, think and feel as I have been taught, and enabled me to see and feel more of what was in front of me; of what was important about the scene in front of me; and perhaps most importantly, to reinterpret various incidents in my past and to see new ways of dealing with both life as it is now and as it will become. It makes sense to me that this process would both help to calm the emergency, and would become wonderful creative fodder during the creation of a new world view.

I note in particular the analogy between what Lukoff recommends for those who are in a state of spiritual emergency and what I was being taught to do in different ways while learning to draw, write creatively and paint. Lukoff says, in essence,

> "Stop trying to understand the thing through analysis, introspection, etc. Just let it be. Go draw, paint, jog, garden. Be good to yourself. Don't be strict with yourself. Don't worry. Be happy."

And from each of our art and writing instructors I heard continually in a variety of different ways, "let go". They told me to stop trying to control my story. Let it tell itself. Let it tumble out. Accept, even embrace, a "shitty first draft". Concentrate on what is really there in front of you. Keep asking yourself, "what do I see?" Squint at it. Move around and look at it from different angles. Ask out loud why it appeals to you. Play with it and how it makes you feel. Just throw paint on the canvass in shapes and colors that seem consistent with how you feel, not what you see. And don't worry about how it looks because you can always fix it later. Let it stay in the realm of feeling and vague image for as long as possible because there it will develop in ways that will often surprise you.

Restorying ourselves is the ultimate artistic act. Our palate is life itself, both already lived and as we can imagine it. We paint with our own blood and tears; write with our dreams. The more of ourselves and the reality around us we can perceive – in essence rather than – the more satisfying the story will be and the more authentic the role we can cast for ourselves. Nothing makes more sense to me now than developing our ability to use the right side of the brain to reframe our relationship to ourselves and the world, and to chart our path through life as the story unfolds.

[132] See "Drawing on the Right Side of the Brain", for example, at http://www.drawright.com/.

I told myself several years ago after taking the first big steps out of Mormonism that I would never again allow myself to be convinced that anything was absolutely, unshakably true. I still feel that way. What I did not realize, however, that this attitude requires of me a continual restorying. As long as I live and continue to have energy, I will be redefining myself and my relationship to the world around me. This will largely be a function of becoming more self aware, and aware of my relationship to the people around me and other aspects of my environment. One of my most important insights of the past few years is the critical nature that the artistic disciplines to which I have been exposed will play in this process.

The process of becoming more self-aware is like peeling an onion. Trying to see and feel like an artist, and then creating something (anything), teaches us to suppress our prejudices in a way that will be helpful in allowing more of what is in my subconscious to come to the surface and more of the reality around me to be appreciated instead of sliding by. This excites me, and does not require anything of me beyond some of my time. I do not need to become an artist to gain the benefits I just described. All I have to do is act like an artist. This is what will teach me about both myself and anything else I care to consider.

My wife and I took a trip to France about a year ago that was particularly helpful to our process of growth and renewal. Juli suggested that this might have a lot to do with the fact that in the old parts of France, it is hard to avoid being reminded that the world is full of different possibilities. Everything is different. The streets are narrow. The houses and other buildings look different. The people speak a language that we don't understand. The food is different. The experience of recovering from jet lag is itself a kind of rebirth that gives the impression that one has emerged into a new world. The environment we chose for this experiment in creativity was close to ideal for our purposes. However, we cannot go to France often, and there are many opportunities to write, draw, paint, etc. around us where we live. We have both committed to incorporating this kind of creative endeavour into our weekly routine, and are excited to see where this may lead.

SOSs and Education About Religion

It is trite to note that our educational institutions have a profound effect on the shape of our social institutions. Various commentators regarding literalist religion's negative consequences have recently pointed to this. For example, Richard Dawkins[133], while discussing his recent BBC documentary "The Root of All Evil" noted that many of the religious problems in Northern Ireland can be traced to the religiously based educational system there. It has created, he suggested, tribes out of people who for the most part come from the same gene pool and have the same cultural heritage.

Daniel Dennett[134] followed a similar tack with his comments respecting religious belief in general. He is floating a proposal regarding a change in the US's religion related school curricula and says he is getting lots of positive feedback. He says that we should have a national curriculum on world religions for all school children – home-schooled, private, public etc. This should include the study of the major religions' (and some minor religions') history, texts, symbolism, rituals, prohibitions, beliefs, etc. These should be presented as facts, without evaluation. These facts, he says, are as important as geography, politics and other things taught in school, and if a religion can't survive without its children learning these facts, it does not deserve to survive. Any institution that must enforce ignorance to survive is not worthy of

[133] See http://www.pointofinquiry.org/?p=36.
[134] See the 25 minute mark of http://www.pointofinquiry.org/?m=200603.

survival. Inculcating ignorance in children is a kind of child abuse, in his view, and should not be permitted. Dennett believes his proposal is an extension of education policy the US already has that requires all kids to receive certain basic and important information.

I would add to Dennett's proposal that the presentation of the sociology of religion as a scientific theory, along with its limitations, is an important part of this matrix. I don't see how the "facts" Dennett references can be otherwise presented, and suspect that he was perhaps a little disingenuous about this since it is harder to argue against the presentation of facts than teaching the sociology of religion.

I have been advocating Dennett's position (modified as just indicated) since shortly after leaving Mormonism about four years ago and becoming familiar with differences between the way religion is dealt with in various European and North American schools systems.[135]

It is useful to frame the educational issue Dawkins and Dennett are forcing up the public agenda in SOS terms. For example, how should we expect Dennett's proposal to affect religious attractor basins? Would they tend to become deeper and more resistant to change, or shallower and more amenable to evolutionary pressure?

And what of the way in which charter schools and various kinds of home schooling are being used by various interest groups to control various aspects of the educational experience? Will these tend to deepen or shallow religious attractor basins?

A common educational foundation creates common social capital and hence works against the creation of social capital that ties an individual to one social group. This would tend to shallow out religious attractor basins.

Speaking practically, the less information flowing between parts of a system, the more each group would know about itself and the less about other groups. This tends to create feeling of in-group superiority. And the less we know about other people the easier it is to dehumanize them, and abuse them.

Hence, separate religiously oriented education creates intellectual and social barriers between groups. This can be thought of as a form of "silo-ization". As noted above, complexity theory explains that the absence of information creates a form of membrane between systems that defines separate organisms. A common religious education would work toward breaking down these membranes and reducing the potential for conflict between the organisms in question, and perhaps even dissolving certain organisms.

The smaller our world becomes the more important it is that these human tendencies be explicitly resisted. The educational system has an important role to play in this regard.

This ties into the evaporation of creed concept that Dennett also mentioned during the podcast referenced above[136]. He noted that many religions now teach that it is more important that we act in certain ways to express our devotion to Jesus, for example, than we have any particular

[135] Dennett is advocating something that approximates the way religion is dealt with in the curriculum of some European countries. I can't cite chapter of verse for this, but Susan Blackmore (see http://en.wikipedia.org/wiki/Susan_Blackmore and http://www.susanblackmore.co.uk/) told me this at a conference I attended at Caltech in May, 2005.

[136] See minute 29 of the podcast.

beliefs about Him. So, don't worry about what the Trinity means or other points of doctrine, but rather live with compassion toward other humans, or life, etc. as Jesus taught.

This is radical change for many religious people, caused in many cases by the cognitive dissonance members of religious groups feel as they become aware of how similar they are to other religious groups. The creeds are, as it turns out, not of practical significance. They are roads to a similar behavioral place[137]. So the creeds are being quietly put aside, to be forgotten, leaving behind love and allegiance as the core of the religious experience. Dennett notes that he does not say that evaporation of creed is a good thing, and that it is only one trend among many.

In has been my view for some time that the evaporation of creed will become an increasingly dominant and important feature of the monotheistic faiths. I think that this is likely our best bet for defusing the religious based violence Dennett and others rightly decry. This is a stepping stone toward pluralism based on a more philosophically stable foundation.

The evaporation of creed does several very important things for religious organisms. First, it makes it harder for religions to compete with each other, and so defuses the tension between religious groups. I see this move happening within Mormonism and have often noted Mormonism's calculated move toward mainstream evangelical Christianity and Mormonism's abandonment of once fundamentally important beliefs in order to fit within that house. This is a well trod path. It is a coping technique for monistic cultures ("We have THE truth") in an increasingly information rich, pluralistic world.

And, perhaps more importantly, I thought it odd that Dennett did not connect the dots between the evaporation of creed phenomenon and the point he so nicely made earlier in the interview about how resistant religious people are to the scientific examination of their truth claims. The evaporation of creed takes this issue off the table. This is part of the lengthy process by which religious people have sought to render their foundational claims unfalsifiable. They go metaphoric in some cases, admit that some ideas are flatly false (remember Galileo) and as science continues to advance, these social organisms must continue to evolve defense mechanisms. The evaporation of creed is one of the best current examples of evolution working its magic in the religious space.

SOSs and the Emergence of Social Compassion

Now for a massive social phase transition.

My time on Star Island this year reminded me of the connection between the Axial Age[138] and the modern notion of social (in-group at least) compassion that came into being then. This is when the "eye for an eye" rule in the Hebrew world gave way to the golden rule. While Christ is commonly credited with this social innovation, most scholars now believe that it pre-dated him by at least a couple of centuries. And we now see another expansion of human compassion to include more life forms and the planet itself. Some people have attempted to understand this through the application of group evolutionary theory[139], which I think has some traction but is likely not the important factor in this case.

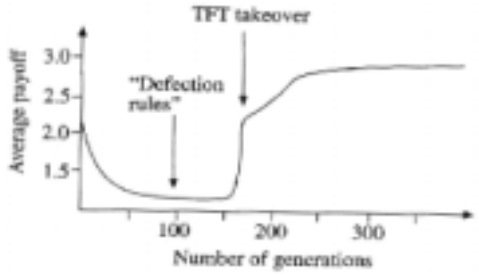
[137] See Karen Armstrong, "The Great Transformation".
[138] See http://en.wikipedia.org/wiki/Axial_Age.
[139] See for example, David Sloan Wilson, "Darwin's Cathedral".

I think both the Axial Age and what is happening now are better understood using complexity theory. Karen Armstrong's "The Great Transformation" offer's one of the best treatments of the Axial Age I have seen from an historical point of view. Philip Ball in "Critical Mass" has a nice chapter in which he uses game theory to explain the Axial Age shift toward compassion without mentioning the Axial Age.

Ball summarizes the game theory research that uses the prisoners dilemma to show that the best way to break out of a pattern of constant cheating (the law of the jungle) is "tit for tat", straight up. That is, "a eye for an eye". However, more wealth (opportunity) is created for all players if they moderate tit for tit into something that might be called "compassionate tit for tat".

We start out assuming our partners will be trustworthy, and even if he cheats us once or perhaps twice, we will forgive him and give him the chance to become trustworthy and maximize the size of the pie for everyone. But if he cheats enough times, we label him a cheater and expend more of our resources than is justifiable from our individual point of view alone to warn the group that we have a cheater in our midst. This trusting pattern allows the group to be the most productive, it is hence the most efficient – an attractor basin[140].

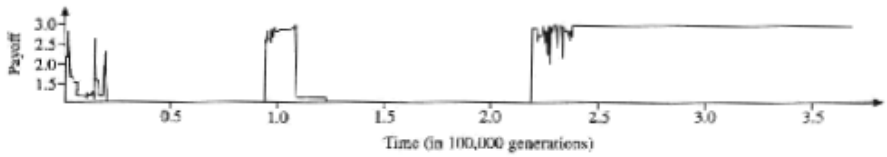
This is modelled in the short term as follows:



18.1 In a mixed population of Prisoner's Dilemma strategies subject to "natural selection" of the most successful, Tit for Tat emerges from a population that has initially become mired in defection. This is accompanied by an abrupt rise in the average payoff for encounters between agents, since TFT allows a greater degree of cooperation.

"Defection rules" is the law of the jungle – cheat and take whatever you can. "TFT takeover" is the point at which the compassionate tit for tat rules begins to dominate the population. Over many generations, the game theory models produce patterns that look more or less as follows:

[140] See the graphics linked to http://www.learning-org.com/01.09/0053.html .



18.2 The changes in proportions of strategies over many generations of a Prisoner's Dilemma simulation are revealed by the changes in average payoff within the population: higher payoffs reflect a higher proportion of cooperative strategies. In these simulations the strategies evolve according to Darwinian selection, and they can take into account both their own last move and that of their opponent. There are several outbreaks of cooperation, the first two of which eventually collapse. The third is persistent.

This shows that once in the compassionate tit for tat model there is a reasonable chance that the population will fall back into chaos at least a few times before the group behaviour stabilizes.

One of the inferences from these models that lines up with many social science observations is that human behavior is drawn to what is most efficient - what “works” - to produce the things the individual or group needs to achieve what they need or want, and particularly, to survive and propagate.

We don't need to rely on group evolutionary theory to support this idea, though the same kind of principle would be at play in the altruistic behaviour of flocking birds (warning against predators, etc.) and other small group animals. In the human case, the observation that another group is using a social or other technology that gives them an advantage is enough to cause new behaviours to be incorporated into some other groups. We would not need to wait for biological evolution. And the groups who adopted the more efficient practices would tend to amass more resources than the others and hence take over. The compassionate tit for tat social environment would tend, for example, to facilitate technological innovation. And so when war breaks out, the "compassionate tit for tat" people had more technology and resources of other kinds, and tended to win. And of course, compassionate tit for tat only applied within the social group. A completely different set of rules existed for group outsiders.

This concept is exemplified by the way in which Christ talked about families breaking up, the eye being plucked from the body, etc. as a result of differences in religious belief. Compassionate tit for tat was mostly limited to in-group interactions. Differences in religious belief drew important lines between groups.

I don't like to use meme theory to explain the move from tit for tat to compassionate tit for tat. Meme theory is only useful in a loose metaphoric sense. I think other paradigms are more useful for understanding how and why culture forms and evolves. And eventually, an information theory like what Terry Deacon is working on (as previously discussed), coupled with far better measurement capacity than we have now, will be required for the foundation of a rigorous, falsifiable theory of social evolution.

So, when I add up Armstrong's history and Ball's game theory regarding the Axial Age, I see human social groups in four different parts of the world (Europe, the Near East, China and India) all reaching an age, size and complexity at which the conditions were right for compassionate tit for tat to emerge. Since this state represents an efficient state or energy minimum for groups of

the kind we are talking about, it was only a matter of time before this happened. It may have emerged separately in all four places, or seeding events could have resulted from the relatively little social interaction between these regions. It would not take much given the conditions just noted. This is the old biological story of organisms growing together, giving up adjacent possibles, becoming interdependent, and eventually becoming a single organism.

Now we come to what we see emerging currently. The planet is on the verge of being overrun by humans. In complexity theory terms, this amounts to more energy in the pot. So much energy that the pattern that sustains life is starting to break down. In order to maintain this pattern, more ordering principles are required to channel, diffuse, or reduce the energy we produce. The rule of social compassion to in-group members amounted to this kind of social ordering principle in the Axial Age. The energy that would have been released against a fellow human being as the result of a slight was muted by compassion. And when fellow humans were suffering (needing an energy infusion) in cases where the old rules would not have elicited any help, the new rules required that help be given (energy released). So the compassionate rule controlled energy during times when the social pattern was at risk of being destroyed because more people were living in close quarters with more resources than ever. It also caused more energy to be released in cases where it was helpful to the social order to do so. What a brilliant adaptive response.

The same kind of thing is happening now. Our numbers and the resources under our control (machines, fossil fuel, etc.) have us bouncing off each other and other life forms and releasing more energy than ever, by far. Hence the problem Al Gore[141] and others point out regarding global warming. Social conflict of various kinds is similarly explained. Likewise for some new diseases that result from our exercise of power over the microbial environment.

The necessity this situation creates is that we constrain or re-channel some of the energy we now produce. Feeling compassion toward other life forms (including humans on the other side of the globe and yet to be born) is a means to this end. And that is what we are seeing start to spring up all around us. Europe is far ahead of us in this regard. Parts of the East never joined the western trend toward technology and consumption and we are now ironically learning to live from them in some ways while they are adopting our technology and in many cases trying to do what we now feel we need to avoid doing.

So, new mores related to our interconnectedness to all life will come into being for the same reasons as compassionate tit for tat (including the golden rule) did in the Axial Age. This process can be aided by international conventions related to the great commons of the planet (sea, air, rainforests, etc.) since the golden rule does not work well unless there is a fairly close connection between humans. I doubt that most humans are capable of conceptualizing the relationships over time and space required to make the kind of short term consumption decisions required to avert disaster. But we humans are well suited to following rules established by credible authority figures and connected to a compelling story - a mythology.

And that is what many of our folders are working on.

Metaphor, Reality and Ontology Shifting

As I have thought about our Star Island experience, I have felt an increasing synergy between life's theoretical and narrative aspects.

[141] See http://en.wikipedia.org/wiki/An_Inconvenient_Truth.

For example, Edmund Robinson noted during one of the discussion groups we were in at Star this year that his preaching has moved toward the narrative from the paradigmatic or theoretical, because he finds narrative preaching to be more effective. I agree, but narrative's effect is limited by its theoretical framework. That is, narrative and metaphor based in science like complexity theory cannot move a Biblical literalist who knows nothing about complexity theory. And conversely, by learning the scientific theory I did while preparing for and attending Star Island this year I have entered a new world of potential narrative and metaphoric meaning.

Put another way, our most basic beliefs about reality[142] limit our ability to comprehend narrative and metaphor. And ironically, because brilliantly crafted metaphor[143] is so flexible and memorable, it will tend to solidify our current beliefs about what is real, no matter how erroneous they are.

If we wish to change society in a constructive fashion, it is important that we use metaphor and other persuasive tools to help people become better connected to realistic ontologies. This requires that we balance our narrative and metaphoric discourse with scientific concepts. One way to do this would be to inject clear, and hence challenging, ontological statements into the kind of great metaphors that people like Karl Peters and Brian Swimme use.

One example of how complexity theory as the scientific paradigm might be used to shift the ontology of a literalist religious person who also takes science seriously, as most do, is as follows:

- A lot of literalist religion's problems can be traced to the trust adherents to those systems place in other humans who hold themselves out as God's authorized agents. Metaphors related to god as nature, god as creativity etc. do little to disturb these beliefs, and in fact are used by literalist religious leaders to cement their power.

- Religious literalists live in the same world we do, and most (in North American and Europe at least) extensively interface with secular communities. Hence, they face problems related to trying to understand and influence social processes both within, and outside of, their groups.

- A complexity theory based understanding of social patterns can be easily demonstrated to be helpful for a wide variety of purposes, such as understanding how financial and other markets work, how political alliances form and function, how marriages work, etc.

- It would then be easy to demonstrate how the same kind of patterns that have just demonstrated their utility in a secular context are also highly explanatory of how religious groups and their belief systems have evolved.

- Think, for example, of the general pattern of religious belief[144] in light of Goethe's famous statement, "As man is; so is his god; thus is god; oft strangely odd". A quick run through a few religious traditions (but not the one to which the listeners in question are faithful) would likely produce agreement with the idea that most of them are likely products of SOSs in particular environments, and that in each case the willingness of a large group

[142] Our "ontological beliefs. See http://en.wikipedia.org/wiki/Ontology.
[143] And most narrative is metaphor.
[144] Particularly, think of the recursive nature of self organizing systems.

of people to accept on faith the idea that a particular leader was speaking for a particular kind of god was responsible for the social coherence that allowed the group to form and prosper at some point, and then later in many cases develop terrific social problems. Any number of literalist Christian, Muslim and Jewish groups could be offered as exhibits in this regard.

- Furthermore, it should be possible to show that, consistent with complexity theory, differences between religious groups in terms of both belief and behavior are far more a function of differences in factors that affect all social phenomena than any underlying reality. And again, as long as the religious group to which the listeners in question belong is not expressly examined, these modes of thought are likely to be accepted.

- Having thoroughly engrained the importance and utility of looking at social systems through the complex systems lens, the tricky question then is to what extent is it useful to challenge directly the ontological beliefs of the particular religious group under consideration. In most cases, it will be best to leave that connection to be made in private by the listeners as they develop "ears to hear".[145]

Throughout this process we would be upfront about how tempting it is to confuse our theories – our ideas about what is likely real – with reality itself. We cannot be 100% certain about reality. And we all have a deep-seated tendency toward this very certainty.

So, as we put forward models of social reality based in complexity theory we will explicitly do so as the most reliable representation of and explanation for reality we have found, but something that is far from certain. We can use the many well studied historical case studies where people (even good scientists) have confused their models with reality[146].

Having again established a pervasive pattern of human behavior in the secular realm, we have the opportunity to return to the tendency of religious people throughout history to observe a pattern in the world around them (storms and plagues come from time to time; sometimes wars are won and at other times lost; etc.) and to explain these patterns using a theory that involves the deities in which their group believes[147]. And it is not a coincidence that religious belief systems have evolved to be non-falsifiable. The falsifiable systems tend to die out as they are falsified.

Hence, once again we see theories coupled with observations that may or may not be accurate and the certainty people tend to have about all important ideas, and how these combine to produce powerful social currents.

So, while we can't be sure whether God exists or not, we can be sure that communication from God to man is unreliable, if it exists at all. This is established by the number of different groups of people who all purport to hear God's voice, but hear conflicting messages.

The final question is given how well complexity theory coupled with the social sciences explains precisely this pattern in many aspects of the secular world, whether it is more likely that it provides the best explanation for the same kind of occurrences in the religious world.

---

[145] See http://www.semanticbible.com/hyperconc/E/Ear.html.
[146] See Peter Godfrey-Smith, "Theory and Reality: An Introduction to the Philosophy of Science", or Sudarshan and Rothman, "Doubt and Certainty".
[147] See Karen Armstrong, "A Short History of Myth".

What I have just outlined is an example of what Stacey Ake described as the "judo" approach to religious dialogue. That is, if one wishes to help someone to change their point of view, the best way to do that is to get to know their position well enough that you can use what they believe to illustrate problems with their own worldview. For example, if they believe that science is generally a reliable source of information, then we can get them to acknowledge the usefulness of certain scientific ideas in one context (as noted above) and then show how their scientific beliefs are in probable conflict with some of their religious beliefs. This will produce cognitive dissonance for them[148]. Thus are new ears grown. The philosopher Hans Georg Gadamer[149] called this painful process "undeception".

Alan Watts describes the approach of the Zen masters in much the same way. They used various techniques to steer their students into the dead ends of their cultural tradition and to force them to deal with – and hopefully make peace with – the fundamental paradoxes of human existence. That is, they determined the ideas to which their students were committed, and then forced the students to address conflicts within those ideas, thus creating a form of ideological chaos out of which new beliefs would emerge within the order created by the Zen system of thought.

Again we find ourselves courting the edge of chaos. Here is Watts' delightful description of one aspect of this process[150]:

"There is not life on the one hand and you on the other. It is all the same. But you see, you can't tell people that and get them to see it. It is just exactly this way with people who know that the earth is flat. They can't be reasoned with. People who believe that the Bible is the literal word of God – absolutely impossible to reason with them at all because they know it is so. So in the same way, we tend to know that we are all separate "poor little me"s and that we are in need of salvation or something. And we know that this is so. And so when someone says, 'Well, you know its not really that way – that feeling of separateness is just an illusion.' [The reply is usually] 'Well, that's all very nice in theory but I don't feel it.'

So what will you do. What will you do with a person who is convinced that the earth is flat? No way of reasoning with them. If it is for some reason important that he discover that the earth is round, you've got to play a game with him; play a trick on him. You tell him, 'Great, the earth is flat. Let's go and look over the edge. Wouldn't that be fun? Of course, if we are going to look over the edge of the earth we have to be careful that we don't go around in circles or we will never get to the edge. So we've got to go consistently along a certain line of latitude westwards and then we are going to come to the edge of the earth, just so long as we are consistent.'

In other words, in order to convince a flat earthist that the earth is round, you have got to make him act consistently on his own proposition and go consistently westward to find the edge of the world. Now at last, when he has gone consistently westward and come back to the place where he started, he's been convinced that the earth is at least cylindrical and he may believe you – take it on faith – that if he goes along a line of longitude the same thing will happen.

But you see, what you did was to make him persist in his folly. Now that's the whole method of Zen. To make people become perfect egotists, and so explode the illusion of the separate ego."

---

[148] See http://en.wikipedia.org/wiki/Cognitive_dissonance.
[149] See http://en.wikipedia.org/wiki/Hans-Georg_Gadamer.
[150] See podcast Buddhism as Dialogue, #3 at .

The Rider on the Elephant

Social phase transitions require consciousness. So, how unconscious are we and can we become? And what should we do; where should we go; with whom should we associate if we wish to raise our consciousness?

I like the psychologist Jon Haidt's[151] metaphor of "the rider on the elephant". We, the conscious riders on our elephants, perceive ourselves to be in control. But we can't help but notice that things regularly don't turn out as we want them to and we have all kinds of elaborate explanations for this. Some of us become aware that we are on top of, or part of, a beast of unseen proportion and tremendous power.

We realize that we, the conscious riders, recently evolved to serve our elephants and that shockingly, the best way to understand this relationship is that "I" am a mere glimmer in the elephant's eye. I am part of it. So most of "me" is unknown and unknowable. As Jeff Dahms so nicely put it in one of the emails he sent to our religious naturalism email list, "we are slivers of consciousness floating on unconscious oceans".

Our beast is the sum of our evolved instincts. For example, we are small herd animals, and have been programmed by our evolutionary experience to seek security and meaning within small groups of people . For most of human history, our connection to a small social group was immensely important. Without our group, survival was extremely unlikely. So we evolved to accept the authority of our group and to reject or not even perceive information that might break our group up or cause us to be thrown out of it, or even marginalized. And this kind of perceptual deficiency shows up relative to all kinds of groups.

Try talking to a hard core baseball fan about a close call at home plate that went against her team, causing it to lose an important game. The chances that she can objectively assess the merits of that call are slim. Or try talking to a committed Republican about Bush's failings, or a committed Democrat about Clinton's.

The bottom line is that we only control our elephant insofar as we help it to get what it has been conditioned by genetics and history to want. We can continue the conditioning process, which for the most part is slow and laborious. Thus are most of our adjacent behavioral possibles defined.

Our best bet as riders is to steer the elephant during its pliable moments into environments where it will likely want what we think we want. And we can make it more pliable through the use of things like meditation, engaging in artistic activities and various other ways. In the meantime, the rider loses all contests in which the conscious will is pitted against the unconscious beast.

My elephant (and most elephants), for example, does not do well in buffets or where food is sitting around. It eats, even through I tell it not to. It eats even though it is already full and "knows" that more eating will make it pay a stiff physical price in terms of lost sleep when bedtime comes. But all I have to do to fix this problem is order off the menu instead of visiting the buffet, and put the food out of my elephant's sight when I get home.

[151] See http://www.happinesshypothesis.com/.

My elephant is unusually stubborn and competitive. This can be good or bad. If I want my elephant to work or exercise, for example, he is easy to trick into it. All I have to do is find a competitive game that requires my elephant to do what I want him to do, or just go to the gym and watch other people for a while.

My elephant is terrifically mimetic. So if I want to be artistic (or scholarly, or golferly (?), or whatever), all I have to do is take a few art classes and hang with the artsy crowd. My elephant will do the rest. If I want to be IRASian – to raise my consciousness while flirting with chaos – I come to Star Island and spend some time on the Internet each week with my consciousness oriented friends.

We could walk through a long list of issues related to cognitive biases (like our tendency to defer to certain kinds of authority) that can help us understand what will make our elephant tend to do things, whether we want him to or not.[152]

Elephants that have been raised in strict, rule bound social groups look a little like circus animals to those raised outside the group – they do the damnedest things. And when released from the circus, they sometimes have a hard time coping in an environment where jumping through flaming hoops, for example, is not rewarded while big prizes are given for things he has not learned to do very well or at all.

Ironically, many things that my elephant has been programmed to do by its evolutionary path and social rules depress me (in the clinical sense). While they were once adaptive, in our current environment of abundance they no longer are. For example, the elephant wants to accumulate as much as possible while the getting is good; it measures status on the basis of what it has hoarded; it eats too much when food is available (as it always is now); it often favors short term over long term relationships; etc.

And most measures of human satisfaction show that less work, more variation in how we spend our time, more time spent with people in intimate community, make us more satisfied with life. Our elephants will not do those things without a lot of training or the careful choice of environment on their riders' parts.

Ritual has long been part of society's ordering structure. The more crowded the group or more harsh the environment, the more ritual. Again, think of the East Indians, Japanese and Chinese. Think of the military.

Ritual one way to harness our elephants' mimetic tendencies and train them. To do this we need to understand the relationship between our ritual acts, our behavior and how we feel. For example, studies have shown that in many instances feeling comes from doing. That is, we can be made to feel happy by forcing a smile or laugh[153]. Many other facial muscles are connected to different feelings in such a way that if the muscles move in a particular way, they cause a feeling. Hence, rituals that force the movement of these muscles in certain ways will cause us

[152] See http://mccue.cc/bob/documents/rs.denial.pdf.

[153] See http://www.phayul.com/news/article.aspx?id=294&article=The+43+Facial+Muscles+That+Reveal&t=1&c=5 and http://www.findarticles.com/p/articles/mi_m1175/is_v20/ai_4077522.

to have certain feelings, and this will in turn make certain behaviors more likely than would otherwise be the case. Listening to certain kinds of music has a similar effect.[154]

Hence, ritual in combination with musical and other sensory experience can cause us to do things that make us feel things, from joy to sorrow to gratitude to empathy to fear to hate. The thoughtful creation of new ritual, or re-working of those evolved within traditional religions, can should be expected to be among the ordering mechanism that we develop as we attempt to guide our elephants towards minimization of the KKR Emergency.

The Denial of Consciousness

A review of human history makes us wonder how much consciousness; freedom; choice; can we stand? We consistently act as though our most precious natural gift – our consciousness – is a burden. That is, some of the most attractive experiences in the human realm involve a loss of a consciousness – a return to something that is more like our primitive mental state – the state in which other animals now live – the temporary merger of rider with elephant.

Andy Newberg[155] describes the powerful and extremely attractive feelings that result from deep meditation and the loss of the sense of self; the sense that we are separate from the rest of reality. Similar feelings are created by being part of a huge crowd, experiencing sudden relief from angst, being in deep sleep, making love, or being absorbed by a task at work or play.

Social groups all work on the basis of ritual and other rules that simplify, and order, human behavior. These reduce the decisions we are called upon to make, and so make us less conscious as well. And these rules are essential to the maintenance of the pattern of human behavior that is society.

The more energy and the smaller the space, the more ordering rules are required. This contributes heavily to the likelihood that the more crowded a place and the longer it has been crowded, the more elaborate and restrictive its social ordering system will be. Think of Japan, India and China in this context. Complexity theory tells us that this is not a matter of cultural style but rather a survival imperative.

For example, the rule of law is shown to be important to economic growth and security of many kinds – without the assurance that our investment of effort and capital will be protected, we don't tend to work as hard or invest as much. This does not prove that lawyers are a good thing after all. Rather, it is a classic illustration of irony – good often comes from bad.

The role of rules in stabilizing society is balanced against the need for society to evolve as its environment changes. Some groups are less flexible than others. Yeats spoke of social

[154] See http://www.pbs.org/wnet/gperf/shows/tchaikovsky4/index2.html Click on "Keeping Score". Let it load. Then click on "Primal Moves". Let it load. Then click on "Emotional Roots", do the little bit of reading required there, experience the types of music illustrated and feel them work up and down your emotional spectrum. And then go back one page and click on "Matching the Music" which is where the fun begins. I recommend the following experiment: (1) Select Edvard Munch's "Scream" as your painting for the first frame, and match it with the music clip from the bottom right hand corner of the selection, which is from Alban Berg's "Three Orchestral Pieces". (2) Save this as frame one. (3) Make the same selection for frames two and three. (4) For frames four through six select "Scream" but match it with the first music clip (top left hand corner), which is a Brahms violin concerto. (5) .

[155] See "Why God Won't Go Away".

masks[156]. He said that society gives us a starting place by virtue of its rules. It puts a mask on us. In some societies, these masks are applied more rigidly than others. Traditional Hindus, for example, are subject to a caste system that prescribes a large percentage of their behavior and people are still killed or maimed when they break the rules that define their caste.

Masks are applied in the west as well. My Mormon ancestors had a huge rule book. The rule book for my children while we lived as literalist Mormons until about 4 years ago was still large by Western standards, but small by traditional Hindu standards.

Part of the genius of the west particularly is that while societal masks are applied on the one hand to create the stability society needs, subversive voices whisper "Rip it off!! You are so much more than your mask!!! Rip it off!!!"

And so generation after generation, in the west more than the east, have challenged the social order that would prescribe their roles, have torn off their masks, and have plunged into what seems like chaos to be reformed – reborn – through its influence.

Western society has flourished under this creative tension[157] between those attempting to stabilize society, and those seeking to change it as well as themselves. And as already noted, the world's great myths speak of this process. The Arthurian legends called for entering the dark forest – chaos – to seek the Grail. Jonah was swallowed by the whale as he tried to avoid his quest. Hercules suffered a similar fate during one of his adventures. Countless other myths tell the same story.

The cry of those who fear rule breaking within society is that if we disobey, chaos will reign. And chaos has engulfed many social groups. Hobbes preferred "Leviathan" – the omnipotent force that would impose order in society – to this chaos. Rousseau's suggestion that members of the social group should willingly don the chains required to be a member of society and obey its "social contract" was a response to the same fear of chaos.[158]

And out of this social soup, democracy evolved and has proven capable of supporting a far greater diversity of behaviour than people like Hobbes and Rousseau dreamed possible. In fact, it is the empowering of the individual and restraint of centralized power that is a large part of democracy's secret. The other large part is that the rules imposed by the empowered people upon themselves to channel their power are put up for grabs every few years when elections are held and governments change. This institutionalized, controlled flirtation with chaos causes democracy to continually evolve.

As noted above, one of the lessons of complexity theory is that the individual agents that make up a group that has the creative, emergent behavior that has characterized human society to date must be relatively simple. Simple agents interacting on the basis of relatively simple rules can produce enormous complexity and a breathtaking collective intelligence, much of which is found in the mores and laws that regulate society. And if the agents become too individually or collectively powerful, the reliable, rule oriented behavior necessary to build complexity and collective intelligence through many iterations of the system does not occur, complexity will decline and disaster may result in a significant pruning of agents. The agents might perceive

---

[156] See http://writing.colostate.edu/gallery/phantasmagoria/spore.htm and http://www.postmormon.org/exp_e/index.php/magazine/pmm_article_full_text/199.

[157] This is complexity theory's edge of chaos.

[158] See http://mccue.cc/bob/documents/rs.are%20mormons%20free.pdf.

this as a catastrophic event or series of events, after which, new complex patterns could be built on the interaction of simpler agents. Remember the dinosaurs? One does not have to stretch too far to find that this is already occurring relative to humanity, as KKR forcefully reminded us.

So, it is somewhere between possible and likely that the blindness; the denial; the unconsciousness that characterizes a large percentage of human social behavior is a result of the same mechanisms that are required to keep us – the agents – simple enough to allow the complex system that is society to function.

How do we distinguish between the wisdom embedded in the mores and rules of some social systems, and what appears to be ignorance or blindness? This is too large a question to tackle here. But we can note that when we look at religious fundamentalists of all stripes and lament their blindness and denial, we should recall the ordering effect systemic social blindness provides in some cases. Many of these groups do not have the social and legal fabrics that we have grown and paid for dearly over many generations of democracy. Recall what happened when capitalism and democracy were introduced at once into the former Soviet Union. Far more chaos resulted than was healthy. The social system could not support the autonomy – the power – thrust upon its agents. A massive international effort shored up that part of the world and arguably was responsible for preventing the spread of chaos. There is no reason to believe that democracy and capitalism would perform any better in large parts of the Arab world were it possible to simply install them there without a long period of preparation.

Democracy has provided us with a platform that supports far more individual consciousness, and hence freedom, than any social system that preceded it. We should consider carefully encouraging consciousness in those who do not have the means to contain it. As our recent adventures with terrorists all over the globe indicate, distant disasters now often come to find us.

And what of our own increasing individual consciousness and power? We have a long ways to go before we exceed the degree of freedom and consciousness that democracy can handle. And we should recognize the restraints on human freedom that have become part of our democracy, and supported by agreement of most members of our society, as a form of wisdom.

I am concerned that our power has far outstripped our wisdom, and that we are in danger of the kind of systematic stripping down complexity theory predicts for agents that are too individually complex, or powerful, relative to the system of which they are part. This is the KKR Emergency. People like Jared Diamond and Al Gore use different terminology to reach the same conclusion.

We need more collective, systemic wisdom, not more individual or collective power. This will hopefully come from grassroots efforts and newly agreed upon social mores (like buying gas guzzlers is immoral) as well as legislative initiatives (like new international legal structures like what we are seeing in the European Union, as well as conventions along the Kyoto line).

Complexity Theory and A Covenant with Mystery

Ursula Goodenough coined the term “covenant with mystery”, and used it in her book “The Sacred Depths of Nature”[159], to convey the idea that not knowing nourishes us, and that we should resist the persistent human tendency to think we “know”. The better we are at resisting this tendency, the richer life tends to become.

[159] See http://www.sofn.org.uk/Bibliography/ursula.html
and http://mccue.cc/bob/documents/rs.the%20sacred%20depths%20of%20nature.pdf.

One of the basic ideas of complex systems theory is the future outcomes of SOSs are not predictable. It is not that we lack information or the time to do calculations. The systems are so complex that brand new things are created through the interaction of the system parts. And these, as well as much more mundane system outcomes, are inherently unpredictable.

Here, we look into creation's womb. This is as deep a mystery as anything theology has to offer. And it is a real mystery. It is not manufactured out of ideas that are disconnected from the reality we can scientifically study. This mystery is offered to us by our best apprehension of reality.

The broader our perspective and more aware we become, the more clear it is that we are not justified in the belief that we can accurately apprehend what is within our view, let alone all that is. Godel's theorems[160], deterministic chaos[161], quantum mechanics[162] and other phenomena, as best we can now understand them, underscore this. And more is on the way. For example, the implication of Godel's theorems have recently been extended by Greg Chaitin[163] to suggest that there are limits to what math can describe, and that we are hence limited in our effort to apprehend what is real.

And yet we must make important decisions. In the face of our ignorance, well-understood perceptive foibles and in mystery up to our eyeballs, we need to find ways to avoid mental paralysis and make the best decisions we can. Science, properly used instead of slavishly followed, unquestionably provides the most reliable means of doing this in a thoughtful fashion, while denial, cognitive bias, etc.[164] as well as our amazingly efficient heuristics[165] are our *de facto* decision-makers in most cases, for good and ill.

As a group becomes more self aware, its members tend to rely more on the wisdom of diverse crowds[166]. And yet the confirmation and other biases in the scientific community (one of our most self-aware groups) are still so strong that Max Planck famously said that science progresses one funeral at a time.

Somehow, in spite all this, technologies that make us more powerful continue to come into being. This is irrefutable evidence that we have enough knowledge of realty to manipulate a few of its bits.

Meanwhile, some of our most farsighted fellow travellers[167] are trying to understand the connection between what we can control - our power - and the rest of what is. They tell us that as we exercise control over small things (like our desire to travel large distances and heat or cool large houses) we set in motion forces that we can only dimly perceive as a result of the frames of time and space over which they operate, a bit like the monkey who having discovered

---

[160] See http://www.exploratorium.edu/complexity/CompLexicon/godel.html and http://www.ams.org/mathmedia/archive/03-2005-media.html.
[161] See http://pespmc1.vub.ac.be/CHAOS.html.
[162] See http://en.wikipedia.org/wiki/Quantum_mechanics.
[163] See http://www.cs.auckland.ac.nz/~chaitin/summer.html.
[164] See http://mccue.cc/bob/documents/rs.denial.pdf.
[165] See http://en.wikipedia.org/wiki/Gerd_Gigerenzer.
[166] See Surowiecki, James, "The Wisdom of Crowds", reviewed at http://www.csmonitor.com/2004/0525/p15s02-bogn.html.
[167] See for example, Diamond, Jared "Collapse"; Wright, Ronald "A Short History of Progress"; Ehrlich, Paul "Human Natures".

a saw and figured out how to use it, is about to cut off the tree branch on which he sits far above the jungle floor, and thrilled with his "progress".

And so our seers, knowing something more about saws, trees and gravity than the rest of us, are deeply disturbed by what they see in the tea leaves available to them. The warning they and others sound have aroused signs that parts of humanity are becoming conscious enough of our power that they choose self restraint. Whether this will be enough to defuse KKR Emergency is arguably our most important social imperative.

So, what are the consequences of a human act? Can we act otherwise than through mostly mental and social inertia? Are we building our future or sawing off our tenuous ties to existence?

We will never run short of mystery. Mysteries can be created out of any nonsense. We don't need more of these chimera that are at best entertaining and at worst increasingly dangerous distractions or deceptions. And the extent to which we perceive and react to the wonderful mystery at the core of reality is more relevant now than ever to how long and well the human aspect of life's drama will continue.

Now, more than ever, certainty and false mystery is our enemy, while mystery of the most real and hence most sacred sort – our *mysterium tremendum et fascinans*[168] – is our inspiration and may be our Savior.

[168] See http://academic.brooklyn.cuny.edu/english/melani/gothic/numinous.html.