Argument for Complexity

by

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A Krebs Cycle Story

I sat at my desk in the center of the third row of my eleventh grade biology classroom staring at the blackboard. Ms. Jones had just told us that this diagram of boxes and arrows in front of us was something called the “Krebs cycle.” She explained that it is a process that occurs in the mitochondria of cells and proceeded with a more thorough explanation of its inner workings. Her words had little meaning to me and faded as she spoke.

To make sense of them, I needed to know where this cycle called “Krebs” was happening. And when? And in relation to what? Was it happening in my cells? All of my cells? Did it occur in all
mitochondria? Does it happen all the time, or only intermittently? I understood the general role of the mitochondrion but did not know if the Krebs cycle was a component of that same role or if it served an additional role. If we could shrink our bodies to a microscopic scale, could we watch the Krebs cycle in action? I knew that nothing is actually invisible; it might just be outside our current modes of perception.

Without the answers to questions like these, I could not move forward. I had no base on which to build a general framework and no framework to fill with moving components. Those boxes just looked like boxes to me, stubbornly refusing to transcend their symbolic form.

At some point I turned to a classmate and good friend, Matt Mirsky, to see if he might help me place the Krebs cycle within the living organism. He looked at me with wide eyes as if to say we could not have been sitting in the same lecture. After all, Ms. Jones had stated several times that this occurred in the mitochondrion of the cell. Had I not been listening? I prodded him further, but it became clear to me that my friend didn’t really know either. What surprised me was that he didn’t need to know. He could see the parts without an image of the whole, but I was lost without context.

Twelve years later, with a BS in biology, Matt is in medical school. I completed my undergraduate degree in environmental design and am days from completing my MFA with an emphasis in sculpture. In the most simplified and rudimentary sense, we have followed paths indicative of our mental strengths. He is better at the tasks defined by sequential reasoning processed primarily in the left brain. I tend to comprehend the world like a typical right brainer: as a holistic schema without the fragmentation inherent in discrete components.
Prologue

“I am, as it were, an eye that the cosmos uses to look at itself. The Mind is not mine alone: the Mind is everywhere.” - Rudy Rucker

My experience that day in high school biology was one of many that allowed me to understand how my mind processes information as compared with those around me. In time, I came to understand that the matter is more complex. It is not enough to say that individuals vary in the manner in which they absorb and make sense of reality, for the very acts of perception and cognition effectively alter reality itself. If there is, in fact, one absolute version of reality, each human being sees that reality obscured by his or her own personal filter. We cannot remove those filters because we are those filters.

So, how can we possibly determine the accuracy of any single measurement if we each use a unique instrument to complete the task? Under this premise, the truth is our word against everyone else’s. And at this moment in time, “everyone else” is over 7 billion people.

I am among those who see the means to a resolution imbedded in the predicament itself. Evolution has produced more diversity and complexity than our singular human minds have the capacity to conceive. But perhaps the miraculous nature of evolution accounted for that. For we do not have just one snapshot of reality; collectively, we have billions. Our task is not to vote on any single person’s vision or even on a group of those we find most appealing. We cannot choose to ignore parts of reality because it would be easier to manage if we did. Instead, we must find more truthful ways of discerning order in the entire collection.

It is a grand undertaking, and one that we have acknowledged to a degree in different ways throughout time. We see a more inclusive methodology in the sciences today with the development of systems thinking, an echo of the holistic concepts that are at the foundation of Eastern religions. But until more of us are able to see and become active participants in the mission, it can’t happen. The negative impacts of our compartmentalized solutions to systemic problems are increasing exponentially. Our fate
will depend on humankind's ability to find new ways to conceptualize more factors at one time. It is frightening to consider this reality, but it implies a responsibility that is both exciting and beautiful in its magnitude. Our collective mental capacity to reflect on the meaning of existence is an opportunity to join together as active participants in our own evolutionary progression.
Background: My Filter

In order to better understand how my thinking progressed to its current stage, it may be helpful to retrace portions of the path that led me here.

Although it was an unsettling experience, I can say in retrospect that the somewhat zig-zagged trajectory of the last 10 years of my life was unavoidable, and perhaps necessary. We are told that straight ascending lines are good -- perhaps because of what they represent: certainty and efficiency. But it can’t be argued that a straight line is good even if it is not right.

In late high school I had trouble focusing because I didn’t see connections between my classes or to the greater world outside of school. I was recruited to play varsity athletics at a large state university. I pursued that option briefly because the immediate visceral rewards of competition and sport allowed me to push the more vexing uncertainties about my destiny off to one side. However, I found the one-dimensional focus required for Division I athletics to be deeply unsatisfying. I not only left the team, but dropped out of college entirely after three semesters to recover my bearings. While working full time at a restaurant, I assembled a rather humble portfolio and applied to art schools. After spending one quarter in an interior design program, I transferred a second time to MICA to seek a degree in environmental design. The curriculum was broader and more abstract than the architectural design programs offered at most schools. I found my three years there to be intellectually satisfying; I learned to problem-solve and think across disciplines. I was gaining clarity about how my interests might continue to develop.

I subsequently choose to attend graduate school for sculpture instead of architecture: I longed to get further from rules and closer to openness. I drove down to the University of Georgia, and my journey toward even greater creative freedom began.
Finding (My) FLOW: Mastery over Process

...at any point in time, what matters most is that we shape the immediate surroundings, activities, and schedules so as to feel in harmony with the small segment of the universe where we happen to be located...  

--Mihaly Csikszentmihalyi

I arrived at the University of Georgia without an overall strategy for the three years to come. At first, my work was marked by repetitive forms that seemed to reference nature. It figured to me and to my peers that I should follow this apparent instinct by a more concentrated study of images in nature. Because there were superficial similarities between what I was doing and the forms created by sculptors such as Tara Donovan and Maya Lin, I also looked to them for inspiration. In my gut I knew that all I would ever produce this way were iterations of previously existing ideas and forms. I needed to be surer of my own creative sources in order to honestly discern with which aspects of the outer world I might converse.
Pictured on the bottom of the previous page are examples of my early work. I made “groups” or “collections,” but could not yet see more complex evolutions or progressions in their relationships. The emphasis at this time was in building my skills base and knowledge of materials.

Words crystallize thoughts, but a crystal is no longer a liquid. Language can act as a screen between the thinker and reality. Creativity often starts where language ends, that is, by regressing to preverbal levels, to more fluid and uncommitted forms of mental activity.iii

- Arthur Koestler

I decided to embrace the one thing of which I was most sure: the truth in my process. I knew there was nothing random or arbitrary about the thousands of decisions I was making over months and months on a single evolving work. Then, as now, each new layer or unit that I added to a piece came out of a direct response to the last unit or layer, as well as to the whole created by all of the preceding layers.

I gradually realized that I am not concerned with mere repetition or accumulation. I found that even more intricate growth progressions based on a systematic set of rules was not what I wanted either. Rather, I was looking to find my way into a much more nuanced, and gradually unfolding reality. I could only believe in the rightness of my decision making when I allowed for exploration without predetermined goals. The transitional characteristics and progressive tendencies imbedded in the final forms that resulted from this way of working were closer to my aims. It seemed more natural, more indicative of the overall idea and image of the evolution and growth of all things. I do not choose these tendencies and characteristics; they choose themselves. In this way, my approach seems truer to life. Nothing living or nonliving continues to conform to a strict set of rules. Over time, the thing itself changes and the rules must change to accommodate it.

I now realize I have not been trying to make new forms out of old parameters. I have been trying to create the parameters themselves.
Another key realization for me was how important it was that I lose my sense of self during the making process. The further I am able to float out of my body, the easier it is to ignore the conventional shapes that fill my head. I have to forget what I think I know in order to create something new.

A few months ago, I discovered the work of Mihaly Csikszentmihalyi, the leading proponent of positive psychology. He has devoted his life to the study of a phenomenon that came to his attention in the 1970s called the “optimal experience” or the “flow state.” The terms refer to a state of extreme fulfillment described by participants across diverse disciplines that can only result from their complete engagement with the task at hand.

Csikszentmihalyi compiled a list of the most common characteristics of this state of being, as follows:

1. There are clear goals every step of the way.
2. There is immediate feedback to one’s actions.
3. There is a balance between challenges and skills.
4. Action and awareness are merged.
5. Distractions are excluded from consciousness.
6. There is no worry of failure.
7. Self-consciousness disappears.
8. The sense of time becomes distorted.
9. The activity becomes autotelic.

I find that when all of these components are in play, I am most happy and my work is most successful. It is not that I believe my process is more valid because I can align it with what an authority has deemed an optimum psychological state; rather, my reading of Csikszentmihalyi has helped me to better understand and improve my natural inclinations. I will discuss more specifically how I have been able to do this in my daily studio practice.

The Mind/Body/Environment Connection:

The order and organization of my studio space is vital to my ability to work most fluidly. If I spend unnecessary mental energy looking for the correct tool or grit of sand paper, I lose a connection to the
form. Like a pianist who knows what sounds will come before he presses the keys, it is important for me to know how an action will impact the form without having to stop and think about it. This idea of the “extended mind” is explained by contemporary information architect Peter Morville as follows:

…our tools, like our bodies, become “transparent equipment.” We see through them to the task at hand. Brain imaging studies have shown that as we build fluency, we incorporate tools - pencils, hammers, bicycles, words, numbers, computers -- into our body/mind schema. Then, in accordance with the principle of least effort, we strategically distribute work through the whole system of mind, body, environment.

It is easier to combine components to create more fluid and dynamic schema when all available components are in view and equally accessible.

“Personalizing patterns of action helps to free the mind from the expectations that make demands on attention and allows intense concentration on matters that count.” - Mihaly Csikszentmihalyi
Gaining Proficiency by Framing and Reframing:

For the past three years, I have paid close attention to the suitability of various material choices, and to the effective organization of my studio space and the time I spend there. I reoriented my studio several times, and, on smaller scales, rearranged the way that I placed my tools at hand for given tasks. Greater proficiency in my process means greater control over the resulting form. To gain formal control, I produced several sculptural works all constructed by layering materials in parallel orientation. Greater sophistication and inventiveness in the complexity of my progressions become possible with more experience.

An increase in proficiency over physical organization produces increased mental capacity.

Framing: Bulletin Board Fall 2014

Reframing: Bulletin Board April 2015
Wonder: The Reason behind the Pursuit

The most beautiful thing we can experience is the mysterious. It is the source of all true art and all science. He to whom this emotion is a stranger, who can no longer pause to wonder and stand rapt in awe, is as good as dead; his eyes are closed. –Albert Einstein

I realize how indistinguishable I am as a speck of matter from the unimaginable immensity of space and time. The perspective is liberating. It prompts me to question the purpose of such incalculable beauty and diversity. What makes it possible to feel a kind of love for others that makes our happiness contingent upon theirs? Why is there music so pleasing to the senses that its splendor can unshackle us from our utilitarian thoughts? Nature offers us sights far beyond any human triumph.

So much is magnificent in isolation, but I am most concerned with the relationship of all of these parts to the whole. I can’t deny the connectedness of things, because I can feel the connectedness. This emotional component underlying my intellectual pursuits allows me a radical openness to all possibility.
Siting the Work:

Wonder promotes adaptation by stimulating the association cortex, compelling the creation of new, more expansive “interpretive” categories. In particular, it motivates us to construct ever more general understandings of reality that might account for the causal source of unexpected stimuli. Put differently, wonder prompts us to think in more abstract (rather than concrete) terms. —Robert C. Fuller

My preoccupation with siting work in relation to architectural interior spaces comes from my desire to incite wonder. It is an attempt to disrupt the expectations associated with typical utilitarian spaces by delightful moments of surprise. When we are surprised, our outlooks can shift to include increased openness and acceptance of the new. It is important to me that my interventions do not have logical or easily deducible relationships to their sites. Instead, I aim to provoke the viewer to fabricate his or her own explanatory scenario that comes after an adjustment of perspective and representation of reality.

Belief, as I use the word here, is the insistence that the truth is what one would “lief” or wish it to be. The believer will open his mind to the truth on condition that it fits in with his preconceived ideas and wishes. Faith on the other hand, is an unreserved opening of the mind to the truth, whatever it may turn out to be. Faith has no preconceptions; it is a plunge into the unknown. Belief clings, but faith lets go. —Alan Watts

Site Specific Work Images:

Pipe Growth
Balsa wood, PVC pipe, insulation foam, gesso
University of Georgia Sculpture Complex, Athens, GA

Pipe growth, shown in the photographs on the following page, was made in reaction to the specific site in which it was installed. Because this corner is located overhead in a hallway, the sculpture could be easy missed if one did not happen to be looking up while passing below. If spotted from below, one might have seen the outer shell of a form that seemed to have sprouted from an old pipe. From the second floor above, the viewer was able to peer into its cavernous interior.
Expand and Contract
Insulation foam, Foamcore, Bristol board, house paint
Bulldog Inn, Athens, GA
**In Relation**
Insulation foam, water color paper, acrylic paint, spackle
Georgia Museum of Art, Athens, GA

This work is about a physical experience that is difficult to capture in a single frame. As one turns the corner toward this hallway, all that can be seen are the protruding forms that lead to the water fountain. After one passes the water fountain (and often not until after sipping a drink), one can see the rest of the piece that appears embedded into this alcove.
“Few people have the imagination for reality” – Goethe
Evolution

...it is not the function that determines the structure but, rather, the opposite, the structure that determines the function. This is the very basis of natural selection, and at the same time it is counter-intuitive.” –Fritjof Capra and Pier Luigi Luisi
The Evolutionary Perspective:

Evolution extends far beyond its roots in Darwin’s explanation for earth’s biological diversity. It can more loosely be characterized as the “broad set of principles and patterns that generate novelty, change, and development over time.”xii I have adopted the outlook as a layer of my personal filter and perspective on the world. It facilitates my efforts to see past the illusion of stasis to sense my place in “a vast developing process the parameters of which we are barely beginning to grasp.”xiii

Outflow
Insulation foam, Foamcore, spackle, conduit pipe
Creature Comforts Brewery, Athens, GA
Convention is this Time, Evolution is All Time:

It is very easy to surrender to the peaceful flow of convention as it carries us through life. But if we do not fight the current, we will never be more than passive participants in our lives and in our broader cultural and biological evolution. Part of what blinds us to truths is the false sense of value placed on all things institutionalized. As Bridgitte Jordan put it, “the power of authoritative knowledge is not that it is correct but that it counts.” We must learn to be our own meaning-makers. And to do this, we must not examine in isolation. Even seemingly discrete ideas or physical objects can be interpreted as the evidence of the transitions, changes, and shifts that brought them about. Everything is a reflection of where it has been and indicator of what it might become.

“Evolution happens at the edges. Evolution happens on the borders, the boundaries, the in-between zones.” -Carter Phipps
Evolutionary and Local Time:

We know how long ten minutes feels, what ten years looks like, and maybe even what one hundred years might look like. It is impossible, however, to truly conceptualize to an equivalent degree a span of time as massive as 100,000 years. Local time we can consider, while evolutionary time remains elusive. But if we managed to increase our capacity to think about time in grander scales it would allow us to see the limitations of short-term thinking.

Considerations that take into account tens of thousands of lifetimes cannot inform all of our choices, but we must learn to make room for them when it matters most.

Much of my work comes from my anxiety about the speed of communication afforded to us by the Internet. I relish the convenience of it, of course -- it helped me find most of the books I used as reference material to write this paper. But what frightens me about its speed is that it allows us to move faster than we can consider and reflect on our decisions. Its speed makes the acquisition of information so easy that the true knowledge and, finally, the wisdom that can be derived from it, is pushed aside in the wake of fresher advices, and is thus devalued. It seems to cut meaning out of the equation altogether. Paul Roberts, author of The Impulse Society, puts this sentiment in these words:

“How can we build anything of real value when everything we make -- every product and service, every achievement, experience, and emotional state-is by definition obsolete the moment we create it? Where under such a model of endless upgrades is there a place for tradition, or a sense or permanence, or a conception of individual commitment to the long term?”xvi
**Outflow** detail Images
Creature Comforts Brewery, Athens, GA
Symphony: Integral Awareness

What are the relationships between categories, connections, and culture? Where are the links, loops, and levers? How can we use our ways of seeing to effect change at a higher level? I speak and write so we might understand and act together. We know what we think when we see what we say. xvii –Peter Morville

Relationship between evolution, symphony, and complexity:

I use the term symphony to refer to the holistic view of the complex relationships between all things and all time. If evolution is a sequential progression that produces complexity, then symphony is the synthetic view of that complexity in a single moment.

Reductionism:

True symphonic thinking has not been stressed in widespread practical application until very recently. Previously, the notion of reductionism, (introduced by the ancient Greeks and refined by Descartes in the 17th century) reigned supreme. Reductionism refers to the idea that something can be understood by studying its parts, by reducing it to its parts. Peter Morville asserts that during the industrial and scientific revolutions that followed Descartes, “reductionism and specialization were so spectacularly successful, they became embedded within our culture.” xviii

Today, our world is a very different place. Daniel Pink describes our most recent transition as a move from “a society built on the logical, linear, computerlike capabilities of the information age” to one “built on the inventive, empathetic, big-picture capabilities of what’s rising in its place, the Conceptual Age.” xix In the 21st century, we know that the whole is actually “more than the sum of its parts,” yet we recognize it in theory more than in actuality.

The reason for this is obvious -- reductionism has significant benefits in certain situations: in isolation and over the short term. As Morville says, its effectiveness is “part of the problem. Success blinds
us to alternatives. And we are reaching its limits. Optimizing for efficiency through specialization eventually compromises overall effectiveness.”

This might explain why I was not fully aware of the distinguishing characteristics of my learning style before my run-in with the Krebs cycle in high school. I had managed as long as the curriculum was simple enough for my brain to assimilate it in the form of floating pockets of information. But as that information became specific and multifaceted, my comprehension diminished significantly.

**The Emergence of Systems Thinking in Mathematics:**

**On Chaos Theory:**

...chaotic systems are characterized by extreme sensitivity to initial conditions. Minute changes in the system’s initial state will lead over time to large-scale consequences. In chaos theory this is known as the butterfly effect because of the half-joking assertion that a butterfly stirring the air today in Beijing can cause a storm in New York next month.

In the 1960s, meteorologist Edward Lorenze used three nonlinear deterministic equations as a simple model to forecast weather conditions. Surprisingly, he found that the solutions to his equations were highly sensitive to initial conditions. “From virtually the same starting point, two trajectories would develop in completely different ways, making long-range prediction impossible.” Up until that time, mathematicians had thought it impossible that deterministic equations might produce such “enormously complex behavior.” Lorenze’s findings marked a shift in the sciences and mathematics from quantities to qualities or from measurements to relationships. Today, computers help us to solve nonlinear equations with speed and accuracy. The result, however, “is not a formula, but large collections of values for the variables that satisfy the equation.” The values can be mapped in ‘an abstract mathematical space called “phase space” to produce a three-dimensional shape, “a dynamic picture of the entire system.”

Thus far, my work has not been an attempt to replicate or represent any specific system or theory. I do not intend to study the mathematics behind these ideas to replicate them with models. However, I am very much intrigued that the progressions in my most recent work resolve themselves in a manner similar
to that suggested by the Butterfly Effect. I begin a sculpture with a very basic shape, and the first few decisions I make have the most effect on the final outcome. Gradually, the patterns, or quality of the transitions between the layers begin to define and refine themselves. It is almost as if the form becomes better at being itself.

The unpredictability of my sculptures is what makes them worth pursuing. It makes the discovery process more enjoyable and the end result more satisfying. *Trapped in Our Maps* is my most recently completed long-term piece. It started as a small, two-dimensional, experimental acrylic painting, and ended as something far different fourteen months later. It embodies the all-at-once, discordant-yet-harmonious perspective of my aims more successfully than any of my previous works.

Evolution, by its very nature, helps us to integrate our thinking. It transcends the neat structures of disciplines mapped out on the university campus and encourages us to lift our eyes to patterns and trends that break the boundaries of compartmentalization. It compels us to think in bigger ways about life, time, history, until finally we find ourselves staring at contexts so fundamental that they can temporarily break the hold of the mind’s incessant fascination with particulates of experience and reveal completely new perspectives on existence. xxvii -Carter Phipps
Trapped in Our Maps
Mat board, water color paper, Foamcore, insulation foam, acrylic paint, spackle
4.5’x 4.5’x 2’
Trapped in Our Maps Details
Progression of Various Interwoven Works
Conclusion:

Last week I called my friend Matt to tell him that he would be included in the opening story of my thesis essay. He wasn’t preoccupied with his place in it and showed genuine curiosity about my overarching propositions. He listened while I hopped from topic to topic and was patient when I wasn’t sure which more advanced technical term to use to describe a particular phenomenon. He showed me that my words had given him insights and offered thoughts of his own. In order to make it through medical school and to be a qualified physician, it is vital for Matt to be a specialist in the physiology and medical treatment of the human body. But he will be a better specialist if he takes the time to consider his role as a healthcare professional in the broader context of society. The goal of my work is to find new ways of seeing and conceptualizing the symphonic complexity of our world today in order to make better sense of it. But to be an effective generalist, I must continue to gain knowledge of the specifics I hope to bring together. To see a more truthful picture of our world, we must be able to look past conventions and the biases created by our personal perspective. We must share and learn from each other through respect and empathy.

When I reflect on where I am now, and where I began less than three years ago, I see that my ideas and the physical representations of those ideas have progressed in a natural way. Throughout my first year, my lack of technical building experience and inability to effectually articulate my vision in any form left me feeling uncertain. There was a great deal of temptation to compromise my efforts to gain temporary relief. But I told myself, the goal is not to produce the most successful piece I can manage by the end of this week or the end of this month. My objective is to make the work by the end of this week or the end of this month that will to allow me to make the best work I can make for the rest of my life.
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xiii Ibid., 27.


xviii Ibid., 155.


xxii Ibid., 114.

xxiii Ibid., 114.

xxiv Ibid., 115.

xxv Ibid., 115.

xxvi Ibid., 115.

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