Navigating the
GREAT
REALITY
SANDWICH
with
William James

THICK

An Everybody's Approach to Chaos

H. Alan Tansson

cover concept

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Navigating the Great Reality Sandwich with William James

(An Everybody's Approach to Chaos)

By H.Alan Tansson
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Cover: "Eight Bells" by Winslow Homer over a photo of the Horsehead Nebula by the Lick Observatory and lifted from *Perfect Symmetry, The Search for the Beginning of Time,* by Heinz Pagels (London, 1985, facing p.157), printed as seen by standing on your head.

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Part 1: Harnessing Chaos

Introduction

"Thick" is a term that William James uses to describe a robust vision of the world as opposed to a 'thin' philosophy, one that only covers a slice across it, even the total picture of that slice. He uses *thick* as a criterion of adequacy, for it applies to reality as we experience it. Any philosophy that doesn't respect the incredibly interwoven complexity with which organisms (human beings included) sense and react to things just doesn't pass the muster. *Thick* is a word he uses for that complexity.

This book is Volume 1 of three. It presents a Jamesian model of chaos as the basic state in which change may be represented and life is experienced. What I've called "The Great Reality Sandwich" is an extreme model of a pluralistic universe—James' own model of a 'pluriverse,' which is a constantly interchanging its sandwiched layers and is never quite still enough to call "a universe."

We need to grasp this much before moving on to Volumes 2 and 3, which are about *work* (of which *energy* is the principle coefficient) and *coincidence* (of which time and space play the principles).

Now a book entitled "Thick," with a subtitle that includes a *sandwich* will automatically bring up the image of a giant multi-layered feast between two pieces of bread—and this is to say a very tangible 'reality' that must somehow be bitten, chewed and digested. And that is about all the subtitle "Navigating the Great Reality Sandwich …" is meant to do; for in order to understand James we must slowly take apart the most cherished part of rationalism, the unity of all things.

If I simply explain how James' pluralism might work, I will have succeeded in this volume's objective. It's a long-shot, because scientists have been trying to get the rest of us to grasp an entirely discrete realm of quantum mechanics for close to a hundred years now, and we still haven't caught onto the idea of a universe that presents us with more than one reality at a time. Yet even quantum theory represents only *two modes of a universal law* while James argued for *multiples* of such measurable realities *before* Quantum Mechanics came along. Which is the task of this volume: seeing things as James might have seen them in 1910, before Schrodinger's cat or his Quantum leaps, Shannon's Information Theory, or Wiener's Cybernetics, before Chaos theory and Mandelbrot's factals.

It is not meant as a book of history, but a book of philosophy, and with its two companion volumes — rather a thick philosophy of its own. The second volume, entitled *The Work of Emotion,* presents a theory of work. It is tied this to the information sorting and disambiguation of events that is performed by emotional life. The final volume in this trilogy, entitled *Coincidensity, or The Pacioli Principle*, is the model of a generalized accounting principle, the postulated model of symmetries supported by this theoretical (and still highly hypothetical) game of posting experience. What this volume proposes is a hypothetical solution to that problem of 'push from behind" or "pull from ahead," for that is *exactly the description of double-entry posting in a ledger book.* Which is all I need to say for now about the Great Reality Sandwich.

To present a book on William James, who contributed his work from 1869 to 1910, would hardly seem of much contemporary interest unless, of course, he is to be one of those rare cases who was speaking to a future audience. But if history is a guide, all the present focusses of attention will one day be described as having morphed into some New Weltenschaung of the Modern Age. So theoretically, one might say James doesn't have to speak to *today,* if he has been speaking to *tomorrow's Weltenschaung* for the past hundred years. The future is always interposing on the present which is still slogging along in the past—so I see nothing wrong with writing a book that speaks to the coming paradigm from out of our intellectual past of over a century ago.

James' world was quite beyond him to explain to his contemporaries, for even though he was one of the great eminences of American science throughout his adult life, when he was no longer around to lend his magnetic presence to his arguments (he died in 1910), his works almost immediately dropped out of sight. All that was left of James were two phrases attributed to him in the footnotes: "the stream of consciousness," and "the blooming buzzing confusion." There was also "the James-Lange Theory of Emotion" though James and Lange never published together and Dr. Lange seems to have attached his name to James' so that *he himself* would be remembered as the proper propounder of the theory.

My subtitle, "Navigating the Great Reality Sandwich with William James" refers principally to the first several chapters of the book that speak to anyone who has not already imbibed of modern Chaos Theory. For today there is a changing view of the term 'chaos' that has been underway for nearly four decades already. It deals with a number of areas of study that we already know the new modern paradigm will address, which includes anything that admits to multiple variable non-linear modelling. To date, it is a vast cross-disciplinary study that so far has not swallowed up its many parents in an undergraduate program—including math, biochemistry, biology, computer science, anthropology, economics, political science, meteorology, etcetera.

James' struggle to introduce his academic gambit of pluralism using the methodology of Radical Empiricism was actually a theory in which everything was in a natural state of chaos, that blooming buzzing confusion that all perception and knowledge must always attempt to straighten out, i.e., linearize. In fact, the term 'chaos' applies to 'order' or 'incipient ordering' in James' Pluriverse, which basically describes the entire ancestral tree of multiple variable non-linear modelling.

However important James' perspective might be to *tomorrow's* world, the purpose of this book is to reintroduce a Jamesian perspective pertinent to *today's world*, one which is paradigm-shifting before our eyes. Let me give an example.

Someone wants to design a reality simulation—a game that imitates experience as most of us would have it. But to do this we should take into account some cognitive differences between different generations of customers. Already several generations have been raised on programming their attention relative to the speed of advertizing, and the upcoming generation of players will have been weaned on smartphones as one of their first tactile devices. Similarly, to adjusting from infancy to the basic interactive mode of social media---sharing video experience and sharing others' thoughts, testing and calibrating one's tastes and appetites and visions against a cloud of the Other, *grading your experience as performance*—will necessarily alter the next generation's perception of what is valuable, time and energy-conserving, and thus essentially 'economic.'

We can, of course, prototype key conceptual facets of our game and subject them to tests—but to design what is and what is not testable is a problem for the philosopher of psychology to tackle, this is not an engineering problem. For as relevant portions of attention-shifts approach the speed of rapid eye movements *our technologies are closing in on physical reality*. Now if we might accept this as true, it would definitely mean that we are approaching a new type of cognitive boundary—which again implies a philosophical criterion regarding human values and motivations within which the strictly mechanical problem of atttention is nested.

And so we should need (as is already the case for gamers) a framework of tests concerning sensory discriminations. And while there is nothing new about this at all, a new *theory* underlying a cognitive *philosophy* as opposed to a physiology of sensory discrimination should be quite valuable. And if it can be shown to have impacts on skill levels, it would be *lucrative as well.* [1]

You might say that there can be no cognitive philosophy that doesn't stem from physiology of sensory discriminations—and this may be quite true. However, James' works—his entire philosophic corpus—was built upon a physiological armature and the fluid boundaries of consciousness that attended the sensory mechanism. And it is James' perspective on testing and on the ultimate role of cognition—

which is not antiquated by the dates in which his data was collected--that I am hoping to reopen and examine.

What we know for sure is that technology is impinging on cognitive function in any number of ways, both expanding what can be sensed as well as taking over roles that allow other senses and awareness to atrophy. To get a grip on what's going on may mean stepping outside of today's premises—for as with so many other things in the sights of modern science, we do not have a complete list of side-effects. This asks for a risk analysis. Risk analyses begin with a brainstorming session, one of the oldest arguments for philosophy. So to understand James' term *thick,* Part 2 of this book will require quite a bit of brainstorming.

The first part of the book presents James' weltenschaung, and the reasons he was dropped from the academic mainstream. Each of the reasons needs to be addressed, for the habits of a century of academic talk have created natural biases that must be overcome before a Jamesian perspective makes any sense at all.

1. Introducing James

In 1905, at the time Einstein made the revelation of his famous equation, William James was the international star of American academic luminaries. But his star quickly dropped from the sky, and his luminescence glowed only for the phrase "stream of consciousness," while he was mostly quoted with the phrase "the bloomin' buzzing confusion (of sensory life)" which *he* imputed to someone else.

James' career spanned fifty years at Harvard, from the 1860's through his death in 1910, where he taught Physiology, Philosophy, and Psychology. At Harvard he created the first experimantal psychology laboratory and his two-volume *Principles of Psychology,* published in 1890 firmly established the field as a natural science. But the *Principles* were never fated to serve as a sourcebook for psychologists, let alone act as an undergraduate text. Most people throughout the century, even today, would tell you Freud was the father of 'scentific' psychology, an assertion James would have good reason to fume over.

James was a physiologist and psychologist because he was a philosopher at the most critical time in the growth of the sciences, at the close of the first scientific century. While the work of psychology was directly available to scientific investigation (as he demonstrated in his lab at Harvard), the interpretation of "self," "society," (and the meaning of "utopia") lay to philosophy. Experimental data on sensory perception, its interplay with motor control and appetite as well as on beliefs and action were both possible and pertinent to many old philosophical questions. Just as psychology and neurophysiological experiments were about to be used in the redesign of the model factory, neurophysiology would have a relationship to our concepts of "self." The nature of that "self" would play a critical role in determining our societal future –for this was a time when the fruits of science (with all the national industrializations) were central to the political rhetoric about workers, farmers, families, freedom, and the paths to utopia….and until WWI broke the bubble for the intellectuals of that time, utopia still lay right around the corner.

Why was James forgotten?

Ironically, it was James' positive reviews of Freud's early papers that brought *that* psychologist (along with Jung) to America for a lecture tour. James felt Freud's rather extreme theory concerning the ego deserved its time in court, where scientific and experimental method would either verify it for future work, or at least direct his intuitions it to some verifiable conclusions. That Freud's untestable theoretics would soon come to dominate the field of psychology, becoming a formally recognized branch of psychiatric *medicine* would have been *almost* incomprehensible to the elder statesman of psychological methodology, as it becomes to anyone studying the old literature in retrospect.

James would have comprehended only too sadly. He had spent the latter years of his career fighting an academic tendency in the human sciences to choose underlying ur-theories that were to be confirmed through experiments _on logic _instead of empirically deductive experiment.

Ur-theories[2] such as abounded throughout the 19th century and well into the 20th are based on rational arguments that are, by their very nature, unfalsifiable—meeting all rational objections through strategic changes in the semantic interpretations of their premises;. For the majority of the 20th century Freud's ur-theory took over the West, while Marx's ur-theory took over Russia and China.

I read James' 2-volume *Principles* in the 1970's as an anthropology student looking for some basic psychology that was neither Freudian, Skinnerian, Pavlovian, or Gestalt. I discovered an incredibly encyclopaedic coverage that addressed *all* the modern fads (except the arcane and by then, mythological Freudianism) as specific sub-problems for the science as a whole, with experimental programs proposed for their verification. All of this, of course, published long before the 1960's versions of those popular controversies had been born. And so it remained a puzzle to me how this could have come about when James had been so esteemed both here and in Europe.

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[2] I am substituting "ur-theory" for "uber-theory" because *all* conceptual philosophies are by definition 'uber-theories." 'Ur-form' is a special sense of a terminology borrowed from the ethnology of Folklore, contemporary with lexicological linguistics that sought out original and pure meanings of a word or a myth. In folklore the 'ur-form' was usually a bowdlerized deconstruction from a wide number of similar sources. To speak of an ur-form *philosophy* is slightly perjorative, but not cynical, for philosophy is always searching for a key to unlock the quandaries of understanding, e.g. an ur-theory of being. In line with James' arguments against "Rational Idealism" the philosophies of the time were aimed at preserving some ideal or "pure" concept of reality (see "A Rationalist Cult and the Failure of Pluralism", Chapter 3 below).

Why was James forgotten by the scholarly mind? Why did all his arguments against the then-popular academic approach to the human sciences fall on deaf ears? I have finally satisfied myself with an answer which becomes fairly clear in the first half of this monograph. Much of it has to do with the logic of the academic ur-theories—which James was not against *thinking up*. But to turn that creative, and positive, conceptual process into science, he required experiment. And he was hampered by the fact that a "falsifiability requirement" had not yet entered the conversation in the philosophy of science; and without this, introduced by Karl Popper in dialogue with the Logical Positivists of the 1930's, an entire post-Einsteinian watershed in academic philosophy was missing, clearly hampering his fight against rationalist idealism of his time. He was, in the human sciences, a loner; one of the few PhD's ("Doctors of Philosophy") who was also a licensed physician (MD, Medical Doctor), and he took physical results as his basic premise of a proof.

Seven Reasons for Ignoring James

The chapter on James in Flower and Murphey's *History of American Philosophy* (1977, Putnam) opens with a very sanguine note, that "a popular Penguin, comprehensively entitled *William James[3],* presents a set of psychological and religious excerpts which must have had as its goal to show the archaism of James' *Psychology* and its irrelevance for philosophy"[4] How this could come about is almost unexplainable when still-illustrious well-respected names as Whitehead, Husserl, Wittgenstein, and Sartre let people know that they themselves turned to James for clarity and guidance.

In a rather obscure compendium of American philosophers *(American Philosophy Today and Tomorrow,* 1935. edit. Horace Kallen and Sidney Hook, NY., Lee Furman, Inc.), which should have been full of his students, or those reered on his works, there is not one mention of William James, while Dewey is noted throughout, along with one of James' own students, a lesser light at Harvard, Santayana.

The closest explanation Flower and Murphey give for James' fall to near-obscurity is that James' style is deceptively 'down-home'. His way of tossing about the extreme realities of the gullible and the insane as a tactical method of framing his logical arguments will take most academic readers by surprise, and quickly lead you to the conclusion he is gullible himself. A new reader will put James down after a few mentions of "psycho-kinosis" or ghosts or his father's Swedenborgian picture of heaven, thinking him to be a backward 19th century soul instead of a tough-minded veteran of mid-century battles on the many fronts of science.

James assumes you already know him to be a hard-nosed empirical scientist who can speak however he feels on nearly anything he felt like speaking of. His reputation at the time preceded him as scientist the way P.T.Barnum's reputation preceded him as a showman. But as Betty and Murray concluded, his conversational style is a put-down on academic pretensions. He was satisfied with expressing himself with engineering sketches and rough calculations on the back of an envelope, full of rough-shod terminology that carries with it an entire swath of hypothesis and associations. Between his peers he expects such sketches to be understood as specifying a range of experiments. But any reader failing to recognize this gets the impression of a farmer walking into airport hanger and confusing it with 'some newfangled barn.' Discounting his talk as mere chatter, they put him down before he walks outside, kicks the manure off his boots and says 'we plan to wheel the space shuttle in there someday!,' and they never see him pointing to a gigantic barn with a sign "Radical Empiricism" sitting out in the cornfields where he expects the work to begin.

A perfect example of this is found in his Manchester University lectures, published as *A Pluralistic Universe* (1909). Throughout this treatise he used the term "thickness" as the criterion for the overall coherence of an argument. It is, in fact, a deep theoretical construct that he never really defines other than by its opposition to *narrow* or *thin philosophies,* which may be tightly argued and fully coherent, but only in a single extrapolation of understanding. "*Thickness"* relates to the dimensions or realms of explanation that a philosophy is intended to cover—to be more specific, not simply *cover,* but to

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[3] *William James. Writings in Psychology edited with a Commentary by Margaret Knight*. Penguin 1950.

[4] Ibid., p.636 (vol.2). I am indebted to this book, for knowing about James at all, since I was hired as the typist in those days before desktop computers, at the time Betty Flower and Murray Murphey were working on the James chapter. As a post-graduate student working on my thesis in Historiography and Cultural Anthropology, Betty suggested buying the new Dover edition of the *Principles of Psychology* if I wanted to get the strongest and most general theoretical background in that field.

allow one to *dance over, flitting between worlds in a single key and rhythm.*. But as I said, James isn't clear about the concept, and certainly doesn't explain it that way. He gives an entire lecture on an example of his favorite "thick" philosophy, that of Fechner (see "The Fechner Example" below, p.26), comparing him to his least favorite "thick" philosopher, Hegel. But this is hardly enough.

Flower and Murphey end their chapter on James with a short discussion of his pluralism, and I must begin here—for having studied James closely, now, it's clear that his extreme stance on Pluralism is the reason he was dropped like an old penny, too hot to handle. He adhered to a conception of a world without a single universal or eternal law underlying reality. He was speaking a different language than ours. His paradigm was different, and he stuck those organizing principles in everyone's face—insisted on using the terms "multiverse" or "pluriverse" when everyone else even today, says *universe*.

This is Reason Number One James was ignored.

By adhering to a pluralist view, James performs the magic of unifying *thoughts* and *things* at a single stroke, and does away with space and time as ontological necessities. More impressively, he does this without recourse to a Spinozoist block universe—using a very straightforward and pragmatic world-view that presents things much as we experience them….but hardly as we *idealize* them. This is the barb that struck his colleagues. James throws out the tattered Plato-worship of words, jettisons ideals, including ideal structures as mathematics. He must be an anti-intellectual. This is Reason No.2 that James was ignored—and would still be ignored.

Counter-intuitively, Pluralism (from a conceptual standpoint) is extremely economic. It is 'theoretically elegant' in a mathematical sense, providing an incredible breadth of explanatory coherence. James considered the experience of life from the standpoint of what *we would consider to be* total chaos— yet he doesn't consider "chaos" chaotic at all. Having need for a concept of "chaos" (a state that is antithetical to order) is only a reductionist view of the nature of a pluralist order….that is, of *Order* in a pluralist's sense. There can be nothing antithetical to order when there can be, and are by their very nature, innumerable orders. There can only be one (or more) orders antithetical to whatever (one or more) order(s) you happen to be using. Order and chaos are part of the same continuum, or Siamese twin-concepts. The "blooming, buzzing confusion" is just his homespun way of describing existence. This is Reason No.3. It is an odd ontological bias that we need to overcome. This is why he considers a 'single unifying law' such as Spinoza's conception (that he calls a 'block universe') or Hegel's (that he calls vicious intellectualism) as the primitive intellectual superstition that he had to shake off himself. The problem is that such intellectual works are powerful in themselves, betokening the powerful intellects that discovered and enunciated them. For by *their* reasoning, by applying their methodological take on existence, there can be nothing left, their intellect has absorbed and theoretically modified it all—*THE ALL.*

In a pluriversal world, there is always more in the 'chaos' out there to create with. From the backbone of James' structure we can conceive of *chaos* as *protean order,* which is of course "by nature" as complex as anything might need be to work. The goal is to define a methodology from which a progressively deeper understanding of the *essence of complexity* is the role of science, and the meaning of learning (as opposed to saying we are after an understanding of progressively more complex things in-and-for-themselves). The causal explanation of any particular complexity in science no longer points to some single unifying equation underneath it—but rather to the particular mechanisms and meanings of its own 'mode' and version of ordering. All things, all modes, all orders are complex—one might say 'equally' complex, since the interpretation of anything may be infinitely nested.

The book you are holding in our hands (or reading on your screen) originated in an investigation of the logic of events—which is just as easily extrapolated to history as it is to sports-casting or experimental evidence in physics. The assignment of interpretive contexts immediately forces you to address the logic of nesting, and the structure of hierarchies which become immediately full of knots. This is the origin of *Thick.* My feeling is that James was intimately aware of the above steps, and problems confronting any logical analysis. The block universe of Spinoza and the universal dialectic of Hegel somehow miss it—they've sidestepped the problem thinking they've covered it.

Yet the reasons James was ignored should represent a good introduction to this famous professor who was open to the paranormal with his well-known support of those who believe in God. This is reason #4, which in the middle-reaches of the 20th century was probably Reason #1.

Varieties of Religious Experience (1902) and *The Will to Believe* (1897) are easily supported within the strictest context of pluralism, since traditionalist religion *is already pluralist*—that is, God operates according to *another set of laws.* The best-known fact about James is that he was tolerant and even supportive of religious beliefs, of so-called 'miracle cures.' Even stranger, he respected the claims of paranormal, of psychic powers and what most would call magic. It is *precisely* this openness to the scientifically inconceivable that provided the excuse for any self-respecting academic to distance themselves from James. It is easy to picture the recurrance of the situation of someone in the audience piping up with something they'd read (and pulled out of context) in William James about apparitions or psychokinesis. How could you put down the question as irrelevant and move along, responding to your interlocutor respectfully, while giving James the deference he deserved? To deal with James seriously you had to take all this baggage of common belief experience on—as he did—and deal with it somehow.

Even here I can't enter into this discussion, for it is too old and hackneyed, and will destroy any rational credibility you should give *my* book; at least until the odd ontological bias noted in Reason 3 is grasped.

The logic of differentiating 'meta'-physical from 'super'-natural or 'para'-normal becomes central to a discussion of 'harnessing chaos' since I've allowed (in my argument for Reason 3) that for any intellectual ordering we extract from things there will always be more orders out there from which to spin another version of THE ALL. This would seem to allow for any wild and wooly world-view, right out of Grimm's *Fairy Tales*. (Why it does not, exactly, I will take on when I consider 'fantasies' below (Chapter 3) as being part of the inductive continuum, like everything perceived in sense or thought, subject to test).

From James' standpoint as a physiologist, trying to isolate the physical from the psychological aspects of what is seen and believed in, all of the data of human experience was open to close scrutiny, including all such 'non-scientifical' reports and disturbances. Since the complexity of human sensing was physiologically clear, that there was no way for all of the activities that must take place in the body accessible to consciousness—this leaves open a large field of sensing activity that takes place "on its own" in a potentially discrete realm of otherwise-sensible-relations. His support of commonplace explanatory strategies through religious or paranormal routes is merely his acknowledgement of the intellectually logical possibility of a discrete realm of otherwise-sensible-relationships, for he must otherwise shelve too much experiential data from personal and historical accounts as irrelevant psychological noise—an attack his physiological and psychological studies didn't warrant. That is, it requires more explanation in the realm of psychology, creating an overburdensome uber-theory, than leaving oneself open to needing another cause of the complexity elsewhere. But this argument rarely convinces the intellectual seeking a single unified explanation *outside* of religion, but ironically, as James often notes, unnecessarily *similar to a religion.*

Reason No. 5 for ignoring James was the fact that at the time he died he argued that the methodology of Radical Empiricism would supercede Pragmatism:. Since James was perhaps the foremost promoter of Pragmatism, by effectively 'turning' on one's greatest contribution to academic philosophy is like John Lennon splitting from the Beatles. James' split was from his well-known band of C.S. Pierce and John Dewey. This would alienate your greatest fans… any of those who'd stuck by you all these years. And Radical Empiricism is the extreme sports of intellectual play, it effectively dispenses with using your brain to collect and manipulate data. You use your brain to *interpret* what you are getting, to assign meaning to what you are seeing and doing.

Reason 6 is what Flower and Murphey considered his 'down-home' style of talk. I have touched on this already. It was the fact that for James, professors at Harvard or any other august institution, were simply working at another trade that made them all, in the overall essence of the social organism, little more than bricklayers or newspaperman for a generation of thought. It's not that he put his peers down, but that he saw the work of others as equal in artistry, complexity and subtlety of performance standards. To consider us all in the same game of exploration and learning together is somewhat demeaning for the intellectual who puts themselves above the crowd for some (generally personal) reason or another. James made the academic look at themselves—but it is easier not to look at James.

Moving beyond James

My original objective was to describe "thickness" so that one might speak of different types, i.e. different qualities of thickness, leading to a set of categories-- *different categories of chaos.* This is the intent of my title "harnessing chaos." But, given the popular usage of the term, it would appear errant nonsense to propose *different categories of chaos*—since "chaos" as we generally think of it is inherently without form. Categories imply some sense of *order*. This is a good reasion to hold tight to James, where order and chaos are but two aspects of the same elephant.

Getting beyond James, however, we need to discuss whatever is taking place "at the edge of chaos[5]"—whether it is the disambiguation and conceptualization going on in the perceptual flux, or the *emergence of complexity…*there is something going on—*activity, work*, sorting and organizing according to some yet-unconceptualized "laws" or "principles," *strategies which are defined and which define the edge itself*.

This strategic balancing is what James calls *pure experience,* which is both thought and thing, both static and dynamic—a terminology that is, unfortunately, a 7th reason his philosophy was dropped like a hot potato. "Pure Experience" is James doing double-flips on a skateboard in mid-air, landing on his feet and gliding calmly to the curb. He tries his best to tell us how it's done. We may not be ready to try this ourselves, but might believe he actually did this and that he's possibly coming from a Weltenschaung that has the potential to do lots of similar work. But most readers don't even get that far with him, which is why it's the last reason he was dropped instead of the 2nd. Whitehead, Husserl, Wittgenstein, and Sartre weren't put off by James' claims, so neither should we.

After introducing James and attempting to get into his mindset through several long quotes from his final works, we will compare this to the modern concepts of chaos and complexity theory. The current talk of Strange Attractors is held down by the idea of "state conditions" that are neither static nor dynamic, challenging both definitions in an attempt to straddle them. This is similar to James' own double-flips. After examining this approach we shall go on to do some skateboarding of our own.

Before he died James had every reason to believe his students and protegées would take his works and run with them. He died in very hopeful times…. before World War One. After that now-forgotten war the Twentieth Century began its inexorable march into the next. Everything changed. It is time to take back what was lost in that lost century, and graft some of the hope back onto what has been gained since.

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[5] The title of Roger Lewin's book *Complexity—Life at the Edge of Chaos.*(1992 Macmillan) describes the history of discovery of enigmatic behaviors in a number of sciences (many of them in the realm of ecology) that seem to run counter to the accepted principles for the randomness of evolution.

2. Blooming Buzzing Confusion

Exploring his output from 1900-1910, James's radical version of Pluralism is introduced in the context of his battle against the "Rationalist Cult" of academia. His concept of 'thickness' is explained through a critique of 'intellectualism,' while the arguments behind his 'populist' philosophical works *Will to Believe* and *Varieties of Religious Experience* are shown to rest on the subtleties of his extreme pluralist stance.

James' Multiple Realities

In 1866 William James returned from an eighteen month apprenticeship with Louis Agassiz on the Amazon collecting plant and animal species. He had trained as an artist, and as such was of great use to Agassiz, but having decided not to be an artist, he jumped on the chance to serve as illustrator for the trip, after which he planned to finish his medical degree in Boston. James' education was eclectic. His father had wealth inherited from investments in building the Erie Canal, who lived as a religious writer and lay philosopher. William, the eldest child had grown up in Manhattan and Europe, in a household where luminaries such as Emerson might stop by for dinner. As a student at the family table he would have argued over the neo-evolutionism of Spencer, revisionist Evolutionism of Darwin, and the first Manifesto of Marx. He studied painting under various masters and in his college years in Europe joined in the intellectual battles of a tumultuous mid-19th century—between Hegelian Germans, Comtian Positivists, and Utilitarian Radicals. When William was being schooled in France, the young John Stuart Mill laid out arguments for a methodology of science, sometimes at odds with Comte over the tenets of Positivism. Not long afterwards, James wrote a review of J.S. Mill's *Logic,* and many years later dedicated *Pragmatism* to Mill. We could consider the primary classification work under Agassiz as his scientific apprenticeship, to make precise distinctions as a naturalist——"The Perception of Reality" appeared in the journal *Mind,* in July 1869[6]. Twenty-one years later he inserted this article, verbatim, into *The Principles of Psychology* (1890). As a philosopher he would spend the next twenty years, til his death in 1910, arguing the case of incommensurability of conceptual organizations —which implied the incommensurability of the realities that conceptual organizations mapped, which has implications beyond that of the individual, for it entails the person of the scientist. Such discrete conceptual worlds must extend into all of science!

The ability to maintain multiple realities becomes a root problem not just for studying the individual, but for philosophy as well, impacting everything from the ontology and structure of being through the epistemology of learning about it; this includes the nature and constraints on mapping, reality, e.g. representation.

Some academics joke they've spent their whole careers working out the implications and justifications for their doctoral dissertation. "The Perception of Reality" became the foundation of his pluralism—a philosophy that says that we continue to believe in a "universe"—unified and whole—but cannot discern nor represent anything but the existence of a "pluriverse" or "multiverse"…toggled, concatenated, infinitely overlapping. We may still speak of a universe, but we functionally exist in a pluriverse.

In 1906 James gave his lectures at Manchester arguing for Pluralism[7], but in 1869 he'd identified seven mutually exclusive "worlds" or realms we use to classify objects and events as 'reality'[8]:

(1) sensed physical things,
(2) physical things as science conceives of them with nothing real but solids and fluids and their laws of motion,
(3) ideal relations and abstract truths expressed in propositions,
(4) illusions or prejudices of common-sense,
(5) "consistent systems," worlds created in story and myths,
(6) worlds of opinion and personal perspective (i.e. pseudo-systems),
(7) worlds of madness. [9]

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[6] this same year James finished his internship at Massachusetts General Hospital and received his M.D
[7] Published in 1909 as *A Pluralistic Universe* (Longmans Green & Co. reprinted 1996 U. of Nebraska)
[8] taken from *Principles of Psychology, Chap. 21* pp.292-3, originally published as "The Perception of Reality" in the journal *Mind,* in July 1869.

The data available to mid-19th century psychology, primarily collected in the world's first asylums, forced him to face the practical fact that we are able to construct different belief-sets alongside one another, and the reason is far from trivial. The basis for establishing belief is *not* through the resolution of our doubts but by constructing or adopting a tentative belief-set tested against a corresponding disbelief-set. This seemingly circuitous logic is actually not far from the logical requirements of induction, but will only be used at critical junctures when actions and consequences are at stake. The asylum data made it extremely clear that keeping one's realities separated may be quite dysfunctional from the standpoint of physical or social well-being, but it doesn't appear to be dysfunctional as regards the feelings, which James then argues act as the overall *governor* of behavior. So belief sets held *as groups* are contingent on 'feeling' rather than directly connected to social well-being, which is an even further compication to the construction and maintenance of the belief-set group. And of course the asylum data only establishes the extremes to which *dysfunctionality* may take us. From the extremes, one should be able to extrapolate the bell-curve and submit *the center* to experiment, where we are all perfectly aware of the seemingly innocuous phenomena of switching out world-views from work to home to school to the playing field or the casino.

> "Every object we think of gets at last referred to one world or another of this or of some similar list. It settles into our belief as a common-sense object, a scientific object, an abstract object, a mythological object, an object of someone's mistaken conception, or a madman's object; and it reaches this state sometimes immediately, but often only after being hustled and bandied about amongst other objects until it finds some which will tolerate its presence and stand in relations to it which nothing contradicts. The molecules and ether-waves of the scientific world, for example, simply kick the object's warmth and color out, they refuse to have any relations with them. But the world of 'idols of the tribe' stands ready to take them in. Just so the world of classic myth takes up the winged horse, the world of individual hallucination, the vision of the candle; the world of abstract truth, the proposition that justice is kingly, though no actual king be just. The various worlds themselves, however, appear (as aforesaid) to most men's minds in no very definitely conceived relation to each other, and our attention, when it turns to one, is apt to drop the others for the time being out of its account. Propositions concerning the different worlds are made from 'different points of view'; and in this more or less chaotic state the consciousness of most thinkers remains to the end. Each world whilst it is attended to is real after its own fashion; only the reality lapses with the attention.[10]

In the context of James' *Psychology* the issue can, in fact, be innocuously shuffled off to "the mechanics of attention," a question of functionality or physical system boundaries. The realities of the insane or the simulated worlds of literature do not immediately have to be answered *as to why they must be held separate,* nor does their existence indicate any corresponding impacts on learning and knowledge. But of course outside of psychology the epistemological consequences are vast—and just as Bacon's *idols*[11] do not yield easily to an interpretation from the standpoint of mechanics (i.e. the structural

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[9] These bear more than a resemblance to Francis Bacon's claim that human perception is beset with several causes of misinterpretation, as James credits Bacon with the underling perception.

[10] *James,* Principles_v*2, pp.292-3*

[11] According to Queen Elizabeth's Keeper of the Keys (Bacon) our tendency is to see things through filters he calls our *idols:*

"As to the confutations of images, or idols, we observe that idols are the deepest fallacies of the human mind; for they do not deceive in particulars, as the rest, by clouding and ensnaring the judgment; but from a corrupt predisposition, or bad complexion of the mind, which distorts and infects all the anticipations of the understanding. For the mind, darkened by its covering—the body—is far from being a flat, equal, and clear mirror that receives and reflects the rays without mixture, but rather a magical glass, full of superstitions and apparitions. Idols are imposed upon the understanding, either,

- by the general nature of mankind;
- the nature of each particular man; or
- by words, or communicative nature.

The first kind we call idols of the tribe; the second kind, idols of the den; and the third kind, idols of the market. There is also a fourth kind, which we call idols of the theatre, being super-induced by false theories, or philosophies, and the perverted laws of demonstration. This last kind we are not at present concerned with, as it may be rejected and laid aside; but the others seize the mind strongly, and cannot be totally eradicated...."

materialism of sensory communication between functional loci in the body), the very fact that we *can* hold multiple world-views simultaneously without any sense of conflict or paradox is not at all trivial.

We do not try to span multiple realities because their existence is functionally justified to maintain conceptual organization. We tacitly allow ourselves multiple incommensurable realities with the presumption they can all be brought into line if we but take the time---and we consider the justification for this as being the well-known *feeling* of the continuity (and therefore "unity") of consciousness, a "unity" which James has much to comment on.

Radical Empiricism

James expects us all, as scientists, to brave chaos. He seems to believe that such a thing as "chaos" must be entirely relative, for we inhale it with every breath of our nostrils, impact of light to our retinas, sound frequency bouncing against our tympanum… eg. with every step we take. The question is, *what do we make of chaos, and how do we make it?* My sense is that James not only understood "chaos," (though he avoided giving it that name) but that he *lived in it* in a way that few of us are presently equipped to handle. By the end of his life he proposed a scientific methodology called "Radical Empiricism," which constituted his own mode of seeing things. Facetiously one might say he was always in the midst of a blooming buzzing confusion. In *A Stroll with William James* (1987), the cultural historian Jacques Barzun's picture of the philosopher makes him out to be from a painting of Winslow Homer, fighting the sea and braving the elements alone. Radical Empiricism is a methodology which I compare to extreme sports, where thinking "rationally" gets in the way of collecting and interpreting your data, for while interpreting your data is obviously the paramount objective, *rationality is required only after the data is in.*

But while I've used the comparison to extreme sports, James never provides us a clear-cut protocol for the methodology—only its premises and constraints, and these amount to little more than his concepts of consciousness and perception in a Pluralist universe. So let me return to the analogy. Consider how many variables are in play for *any athletic skill,* let alone the split-second analysis being left ot *instinct* during an extreme sport. Forget the rapid-fire coordination of trick skate-boarder flying through a fifty foot jump. Take something much slower and easier to comprehend, like extreme climbing. The greatest super-computer couldn't be programmed to handle as many multi-variable problems as the extreme climber, scaling vertical cliffs with no equipment, encountering complex variable problems every moment, balancing instantaneous calculations of wind-current, humidity, displacement energies required for dynamic weight-shifts in conjuction with finger-muscle strain…. to scale a thousand feet or so in an afternoon of sweat.

James insists that we are, in fact, doing extreme climbing all the time. His epistemology and ontology of being have led him to conclude that our "rational" processors are handling far more than anything that can be represented "rationally." If multi-variable problems—dealing with n-dimensions simultaneously—were simple, any genius could write the computer program to handle it all simultaneously. So far, we cannot, and self-proclaimed prodigies who insist they can are considered *naifs*.

In doing science, what we still must do to "rationally" handle problems with n-numerable variables is to throw whole sets of variables into buckets as "constants" so as to isolate one at a time. Scientific methodology teaches you to hammer in pitons and brace yourself with ropes—a careful and presumably safe methodological art-form of isolation and concatenation; but it also teaches one to choose mountains with clear-cut paths, and you will eventually define "mountains" as those which are similarly scalable….and see only those as relevant.

The Battle for Pluralism

Some Problems of Philosophy was left unfinished at James' death, and was written to be an undergraduate introduction to philosophy. It represents James' most definitive arguments for Pluralism[12], which we can consider after touching on the major subjects around which he makes the Pluralist argument.

(from Book IV, Chap.4, para.8, Advancement of Learning, London 1605, by Francis Bacon (Lord Verulam) 1899 Colonial Press edition.

[12] A list of his later books *Pragmatism*: *A New Name for Some Old Ways of Thinking* (Lowell Lectures,1906), *A Pluralistic Universe* (1906 Hibbert Lectures, published 1909), *The Meaning of Truth: a Sequel to "Pragmatism"* (1909); *Some Problems of Philosophy. A Beginning to an Introduction to Philosophy.*(draft published by Henry James 1910); *Essays in Radical Empiricism* (post-mortem collection articles by Ralph Barton Perry). Of these, *Some Problems* makes the greatest argument for James' pluralist viewpoint.

And so, to simplify the history of philosophy down to basics he leaves the student with six terms (three concept pairs): percept/concept, one/many, novelty/change. From these he suggests the student philosopher can rebuild most anything that's been said about anything in philosophy. There is one extra term that he adds in his appendix, *belief,* which we touched on when discussing belief sets in his 1869 article. Having explained this much, I need only add that "the Perceptual View" in the following Table of Contents refers to a Pluralist approach, while "the Conceptual View" is his attack on Rationalism. I shall quote liberally from several of these chapters, later.

The Table of Contents for *Some Problems of Philosophy* is as follows:

Percepts and Concepts

The key to understanding James is the percept/concept distinction. James' own introduction is more appropriate than anything I could summarize in twice as many pages. We shall be able to discern his picture of *chaos* in the way he discerns basic acts of experience and, as you shall see, this quote taken from the end of his life picks up directly from the thesis quoted from the beginning.

> "The great difference between percepts and concepts[13] is that percepts are continuous and concepts are discrete. Not discrete in their *being,* for conception as an *act* is part of the flux of feeling, but discrete from each other in their several *meanings.* Each concept means just what it singly means, and nothing else; and if the conceiver does not know whether he means this or means that, it shows that his concept is imperfectly formed. The perceptual flux as such, on the contrary, *means* nothing, and is but what it immediately is. No matter how small a tract of it be taken, it is always a much-at-once, and contains innumerable aspects and characters which conception can pick out, isolate, and thereafter always intend. It shows duration, intensity, complexity or simplicity, interestingness, excitingness, pleasantness or their opposites. Data from all our senses enter into it, merged in a general extensiveness of which each occupies a big or little share. Yet all these parts leave its unity unbroken. Its boundaries are no more distinct than are those of the field of vision. Boundaries are things that intervene; but here nothing intervenes save parts of the perceptual flux itself, and these are overflowed by what they separate, so that whatever we distinguish and isolate conceptually is found perceptually to telescope and compenetrate and diffuse into its neighbors. The cuts we make are purely ideal. If my reader can succeed in abstracting from all conceptual interpretation and lapse back into his immediate sensible life at this very moment, he will find it to be what someone has called a big blooming buzzing confusion, as free from contradiction in its 'much-at-onceness' as it is all alive and evidently there.

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[13] [James' footnote] In what follows I shall freely use synonyms for these two terms. 'Idea,' 'thought,' and 'intellection' are synonymous with 'concept.' Instead of 'percept' I shall often speak of 'sensation,' 'feeling,' 'intuition,' and sometimes of 'sensible experience' or of the 'immediate flow' of conscious life. Since Hegel's time what is simply perceived has been called the 'immediate,' while the 'mediated' is synonymous with what is conceived. [my footnote: the following represents pp.48-53 in the 1940 edition of *Some Problems*]

"Out of this aboriginal sensible muchness attention carves out objects, which conception then names and identifies forever—in the sky 'constellation,' on the earth 'beach,' 'sea,' 'cliff,' 'bushes,' 'grass.' Out of time we cut 'days' and 'nights,' 'summers' and 'winters.' We say *what* each part of the sensible continuum is, and all these abstracted *whats* are concepts.[14]

"The intellectual life of man consists almost wholly in his substitution of a conceptual order for the perceptual order in which his experience originally comes. But before tracing the consequences of the substitution, I must say something about the conceptual order itself.

Trains of concepts unmixed with percepts grow frequent in the adult mind; and parts of these conceptual trains arrest our attention just as parts of the perceptual flow did, giving rise to concepts of a higher order of abstractness. So subtile is the discernment of man, and so great the power of some men to single out the most fugitive elements of what passes before them, that these new formations have no limit. Aspect within aspect, quality after quality, relation upon relation, absences and negations as well as present features, end by being noted and their names added to the store of nouns, verbs, adjectives, conjunctions, and prepositions by which the human mind interprets life. Every new book verbalizes some new concept, which becomes important in proportion to the use that can be made of it. Different universes of thought thus arise, with specific sorts of relations among their ingredients. The world of common-sense 'things'; the world of material tasks to be done; the mathematical world of pure forms; the world of ethical propositions; the worlds of logic, of music, etc., all abstracted and generalized form long forgotten perceptual instances, from which they have as it were flowered out, return and merge themselves again in the particulars of our present and future perception. By those *whats* we apperceive all our *thises.* Percepts and concepts interpenetrate and melt together, impregnate and fertilize each other. Neither, taken alone, knows reality in its completeness. We need them both, as we need both our legs to walk with."[15]

One vs Many, Novelty and Change

Having shown that the world of concepts quickly become the playground of continuous perception and creation, James makes it clear that from the standpoint of the conceptual world all the problems of philosophy are beset with difficulties of recursiveness. All concepts and ideals (clear or unclear) are very quickly confused with the physical world of *pure percept,* and one has nowhere to place your instrument in deciding on the calibration standard measuring "the real." Having recourse to "eternals," such as the truths of mathematical relations are admittedly worth considering…but to this he presents the conundrums of continuity and the infinite, (the one/many problem) which besets mathematics, and mitigates its use as a final calibration of reality and experience. Finally, he considers the "big" problem of novelty—which he conflates with another key issue, that of complexity, fittedness (and harmonics), and the ancient almost childish question of whether things come about by incremental growth or somehow spontaneously.

The guiding objective of *Some Problems in Philosophy* is to show that, even when we do not have solutions to many of the questions, it is more economic to philosophize from a Pluralist perspective—considering all questions from the standpoint of the blooming and buzzing confusion of percept and "pure experience," building up one's framework of concepts through to empirical trial and error, and remaining open to skeptical disproof.

Naturally, the balance of the book treats one/many and novelty/change from the standpoint of perception, that is through the "immediate flow" of conscious life, of sensation,' 'feeling,' 'intuition,' and sometimes of 'sensible experience.'[16] In this way he introduces the Pluralist perspective. What becomes most confusing however, is that James does not consider the pure perceptual flux that meets the percept as any more "real" than the world of concepts. A most difficult *thing to think,* James considers thoughts *as real as physical objects!* (From *THINK* to *THING!*)

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[14] a detailed footnote referencing other authors' use of the term *conception* and leading up to an argument with Kant occurs at this point in the text. Another bibliographic note occurs at the end of the next paragraph.

[15] pp. 48-53, *Some Problems in Philosophy.* Chapter IV. Footnotes

[16] see footnote 13, above.

In *Essays in Radical Empiricism* we find out that thoughts are as real as the light-waves, sound frequencies, tactile, and taste senses that mediate the physical presence of a world outside our heads!

And again he finds himself at odds with the philosophical world of his time, those "Rational Idealists" who continue to see the fruits of their logic <u>as set apart</u> –with the eternal truths of mathematics, and adhering to an immanence separate from the rest of the existence they analyze.[17] James sees the "eternal truths of mathematics" to be quite real, but no moreso than any of the many real potentials in this multiversal world we share.

Change

James discusses the philosophical problem of change within the context of novelty. This needn't be so, as we don't generally consider simple movement from here-to-there as 'novelty.' Change was one of the earliest conundrums of Western philosophy in the decades preceding Socrates (who himself appears at the end of the Periclean Athens). Heraclitus posed the empiricist dilemma, that to all appearances nothing ever stays the same…we are caught in time as in a river constantly flowing around and through us, and nothing can avoid change. Zeno took up the Rationalist position, showing that one could bring infinitessimal analysis to bear on both change and time, proving them paradoxically to be logically self-contradictory and illusory.

James' arguments, skewed against the Rationalist who prefers logic and ideal relations of eternals, and unchanging ultimates, come full force against Zeno in the discussion of novelty. He takes a rather long digression into the discussion of transfinites, recently introduced by George Cantor. For James, the infinite seems a kind of Rationalist scam –and indeed, only where everything must be linearized (or "numerized") and assigned a number, do infinites come into play. In the world of pure percepts, as we shall see, nothing is countable—it cannot be linearized or subjected to infinites. This is the world of REALS that James wants us to be concerned with in *Some Problems* The talk of Zeno and the work of Cantor is derivative conceptual play, which he recognizes and will invest his efforts in learning and dealing with, but scorns as the real essence of philosophy—rather like earning your wages from the stock and futures markets instead of raising your own cane and setting up a sugar refinery….which nevertheless depend on the investments from the derivative marketplace of knowledge.

To summarize *Some Problems in Philosophy*, as stated earlier, he goes to great lengths to show that Rationalism falls short and causes more logical problems than it solves. He does not, however, fully extrapolate the logic of Pluralism to its conclusions, where the *conceptual world* that we live in is for the most part obliterated. He does this elsewhere. *Consciousness, things, space, time* all take on a new flavor…if they don't disappear altogether. While the concepts remain to be put to use, the perceiving eye, ever-ready to conceptually reconstruct reality to explain what it thinks it is recording, will be ready to ditch the old meanings of such terms if they need reconstruction.[18]

Mind/Body

Essays in Radical Empiricism is a collection of articles that refer to one another, quite like a book but published after James' death by his biographer and student, Ralph Barton Perry. James is more explicit about the process and purpose of knowledge as being "the work of experience in general," which is disambiguation of perceptual flux, which we've already met as being rather close to "chaos," but which James does not conceptualize as a fixed state.

We have already met this in his careful separation of *percept* from *concept…*where the conceptual world has been disambiguated for us by our language and culture, as well as the fact that we are actively working throughout living experience to disambiguate the world of percepts, to turn it to sets of concepts within hierarchies of relationships.

> "Our body itself is the palmary instance of the ambiguous. Sometimes I treat my body purely as a part of outer nature,. Sometimes, again, I think of it as 'mine,' I sort it with the 'me,' and then certain local changes and determinations in it pass for spiritual happenings. Its breathing is my 'thinking,' its

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[17] *Some Problems of Philosophy* seems inordinately taken up with this polemic with his colleagues; and given the force of it, with outright mud-slinging that breaks out in the *Essays*, he seems to realize he has probably already lost the battle.

[18] Here is our Brahma bull (Chaos) at work as a concept, ready to break free and go back to its free state.

sensorial adjustments are my 'attention,' its kinesthetic alterations are my 'efforts,' its visceral perturbations are my 'emotions.'"(ibid., p. 153)

In an interesting approach to putting away the old "mind-body" problem, which has seemed to plague philosophy from its earliest days, he concludes that mind/body is *naturally* ambiguous, AND <u>that it is supposed to be that way</u>.

"If 'physical' and 'mental' meant two different kinds of intrinsic nature, immediately, intuitively, and infallibly discernible, and each fixed forever in whatever bit of experience it qualified, one does not see how there could ever have arisen any room for doubt or ambiguity. But if, on the contrary, these words are words of sorting, ambiguity is natural. For then, as soon as the relations of thing are sufficiently various it can be sorted variously."[19]

He continues—digging deeper into the mind-body problem by touching on the confusion caused by the "irrational" emotions, leaving ambiguity as a natural condition, and allowing what is important to us to the work of experience as the sorting operation—which may move something alternately (or back and forth along a continuum) between 'physical' and 'mental' realms.

"Take a mass of carrion, for example, and the 'disgustingness' which for us is part of the experience. The sun caresses it, and the zephyr wooes it as … a bed of roses. So the disgustingness fails to *operate* within the realm of suns and breezes, it does not function as a physical quality. But the carrion 'turns our stomach' by what seems a direct operation—it *does* function physically, therefore, in that limited part of physics. We can treat it as physical or as non-physical according as we take it in the narrower or in the wider context, and conversely, of course, we must treat it as non-mental or as mental." (idem)

Most notably (a point often argued and noted in the later scholarship) the first chapter of the *Essays* essentially does away with the concept of 'a seat of consciousness.'[20] At a sweep James also does away with that ever-familiar distinction between thoughts and things, replacing it with a view of the active self that most readers will find difficult to digest. First speaking of the common view of consciousness he says,

"We, for our part, *know* that we are conscious. We *feel* our thought, flowing as a life within us, in absolute contrast with the objects which it so unremittingly escorts. We can not be faithless to this immediate intuition. The dualism is a fundamental *datum;* 'Let no man join what God has put asunder.'

"My reply to this is my last word, and I greatly grieve that to many it will sound materialistic. I can not help that, however, for I, too, have my intuitions and I must obey them. Let the case be what it may in others, I am as confident as I am of anything that, in myself, the stream of thinking (which I recognize emphatically as a phenomenon) is only a careless name for what, when scrutinized, reveals itself to consist chiefly of the stream of my breathing. The 'I think' which Kant said must be able to accompany all my objects, is the 'I breathe' which actually does accompany them. There are other internal facts besides breathing (intracephalic muscular adjustments, etc., of which I have said a word in my larger Psychology), and these increase the assets of 'consciousness,' so far as the latter is subject to immediate perception; but breath, which was ever the original of 'spirit,' breath moving outwards, between the glottis and the nostrils, is, I am persuaded, the essence out of which philosophers have constructed the entity known to them as consciousness. *That entity is fictitious, while thoughts in the concrete are fully real. But thoughts in the concrete are made of the same stuff as things are.*"(ibid., p. 36-37)

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[19]*Essays in Radical Empiricism*, p. 152. "The Place of Affectional Facts in a World of Pure Experience." [reprinted from *The Journal of Philosophy, Psychology and Scientific Methods*, May 1905]
[20] "Does Consciousness Exist?" *Essays in Radical Empiricism.* Longmans, Green & Co. 1912. reprinted U.of Nebraska, 1996.

Later on he refers to this quote, tying it to the central feature of (his sense of) what a Pluralist world-view entails: what he dubs 'pure experience.' As we shall see, he has entirely recast the use of the term "experience"—standing *us* on its head—by suggesting that *our experience* is simply a special case of what the pluriverse is made of *generally:*

"I tried, in [the first essay] to show that thoughts and things are absolutely homogeneous as to their material, and that their opposition is only one of relation and of function. There is no thought-stuff different from thing-stuff, I said; but the same identical piece of 'pure experience' which was the name I gave to the *materia prima* of everything) can stand alternately for a 'fact of consciousness' or for a physical reality, according as it is taken in one context or in another." (Ibid., pp.138-9)

"'Pure experience' is the name which I gave to the immediate flux of life which furnishes the material to our later reflection with its conceptual categories. Only new-born babes, or men in semi-coma from sleep, drugs, illnesses, or blows, may be assumed to have an experience pure in the literal sense of *that* which is not yet any definite *what,* tho' ready to be all sorts of whats; full both of oneness and of manyness, but in respects that don't appear; changing throughout, yet so confusedly that its phases interpenetrate and no points, either of distinction or of identity, can be caught. Pure experience in this state is but another name for feeling or sensation. But the flux of it no sooner comes than it tends to fill itself with emphases, and these salient parts become identified and fixed and abstracted; so that experience now flows as if shot through with adjectives and nouns and prepositions and conjunctions. Its purity is only a relative term, meaning the proportional amount of unverbalized sensation which it still embodies." (ibid., pp.93-94)

" Far back as we go, the flux, both as a whole and in its parts, is that of things conjunct and separated. The great continua of time, space and the self[21] envelope everything, betwixt them, and flow together without interfering. The things that they envelope come as separate in some ways and as continuous in others. Some sensations coalesce with some ideas, and others are irreconcilable. Qualities compenetrate one space, or exclude each other from it. They cling together persistently in groups that move as units, or else they separate. Their changes are abrupt or discontinuous; and their kinds resemble or differ; and, as they do so, they fall into either even or irregular series." (idem)

In the quote that follows he is still describing what is presented to "pure experience," before conscious processes take place:

"In all this the continuities and the discontinuities are absolutely co-ordinate matters of immediate feeling. The conjunctions are as primordial elements of 'fact' as are the distinctions and disjunctions. In the same act by which I feel that this passing minute is a new pulse of my life, I feel that the old life continues into it, and the feeling of continuance in no wise jars upon the simultaneous feeling of a novelty. They, too, compenetrate harmoniously. Prepositions, copulas, and conjunctions, 'is,' 'isn't,' 'then,' 'before,' 'in,' 'on,' 'beside,' 'between, ' 'next,' 'like,' 'unlike,' 'as,' 'but,' flower out of the stream of pure experience, the stream of concretes or the sensational stream, as naturally as nouns and adjectives do, and they melt into it again as fluidly when we apply them to a new portion of the stream."(ibid. p. 95)

What is the "first duty" of any investigation using Radical Empiricism will be to organize the various "copulas" or connections between things that have fallen, through the "pure experiencing of the sensory system" into even or irregular series.

Now I fear doing injustice to James by *interpreting* him with a statement that he never made himself—for I cannot fathom why he avoided saying what seems obvious—which is that we may turn the notion of chaos upside-down, *understanding everything as in a continuum with* what most rational people consider 'the chaotic.' I trust that James saw that he had been doing and saying just that, but for some

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[21] This primal connection of "the self" with time and space as connected to his description of the flux is critical to our discussion of James and need be pointed out in its original context, here.

reason does *not* take the extra step to say it this way I believe that the above quotes support this point. However, the problem with James *is* in grasping the totality of his implications, for indeed, they make hash of our normal perspectives. Take, for example, this assertion, which is so straightforward and simple it is almost innocuous-sounding:

> "…*experience as a whole is self-containing and leans on nothing.*"[22]

He then goes on to claim that

> "'…my primary reason for advocating it [this approach] is its matchless intellectual economy. It gets rid, not only of the standing 'problems' that monism engenders ('problem of evil,' 'problem of freedom,' and the like), but of other metaphysical mysteries and paradoxes as well."[23]

So one might intuit from this that if James is claiming the same reality for a thought (within a belief set) that as a physiologist he connects through the sensory equipment to its neural and chemical phases, directly down to the atomic (and necessarily quantum) realms of reality. In this way he seems to speak of the material world as working analogously to the experienced world of thought. These are, according to him, simply part of a continuum. What we are traversing and interacting with in everyday experience uses the very same principles as the rest of creation. Our thought stream, of which he gave a description of "pure experience" (as described for the babe or the person waking from a semi-coma) is much the same as the stuff of the elements, of the same "pure experience" that the RNA molecule participates in as it is awaking to its work. And yet *its work* will differ from the pure experience just so much as *our consciousness* differs from "pure experience"….for the work of the RNA molecule is already proceduralized to organize and rank all the copulas and relations that it encounters in the flux..its local flux.

One might say, "*our consciousness is our work*." Our inventories of "pure experience" as we locally encounter experience has already been for the most part proceduralized for us—procedures iteratively developed as our cognitive faculties grew from those of the new-born infant, who still participated in "pure experience" of percepts without any conceptual buttresses. Yet even the newborn has already been (cognitively) proceduralized to the rhythms of life in the womb, heartbeat and breathing, cycles of human nutrition, sleep and alertness, etc. So to that extent is the human "work" (which James might allow the term "consciousness" to be applied to) proceduralized---and to this extent much of the "chaos" of his "pure experience" is already tamed for him. It is in *this* sense that I can compare our work of consciousness (whether the consciousness of the infant or of the Chief Justice of the Supreme Court) with the work of the RNA molecule, continually awake to its proceduralized efforts, its "do's and don'ts" that may sometimes face a tentative choice and make a mistake that simply doesn't work.

For James, work with surface phenomena of life was about the deep structure of *everything,* and he spent his life trying to explain this essential connection between scientific work and life, as it is lived, to his academic confederates. He failed. Pluralism, as a scientific ethos or way of thought, was never really born.

James' Criterion of Adequacy

An adherence to Pluralism is extremely economic in the facility it gives one to conceptually play around. This is at first counter-intuitive, as we'd think that holding onto a single-principled unified program is the easiest and quickest way to run checks against theories. But on a moment's reflection you can see where the efficiencies come from. It can pay to start sloppy, as long as you hold onto a strict criterion of what constitutes a correct performance—e.g., your criterion of adequacy. Any number of trials can be quickly run and evaluated side-by-side. On the other hand, a unifying principle will insist you organize them now as competitors, and your criterion of adequacy must include a criterion of

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[22] in its full context: "…though one part of our experience may lean upon another part to make it what it is in any one of several aspects in which it may be considered, experience as a whole is self-containing and leans on nothing." From "The Essence of Humanism" *Essays*., p. 193.

[23] Further on he explains "It gets rid, for example, of the whole agnostic controversy, by refusing to entertain the hypothesis of trans-empirical reality at all. It gets rid of any need for an absolute of the Bradleyan type… by insisting that the conjunctive relations found within experience are faultlessly real. It gets rid of the need of an absolute of the Roycean type…by its pragmatic treatment of the problem of knowledge….(ibid., 195).

ordering…better from worse. This implies a basic criterion of *function*—which you have already set in stone, as a 'unifying principle,' and so with all of your trial hypotheses side-by-side you shall have to spend your energies on proving which unifies *better,* and in *what sense* you intend to carry out the unification. All of this is a waste of resources for the pluralist—who is happy to verify the adequacy of each of the trial runs within the stated scope of the experiment, and let all those that pass stand side-by-side as you collect more and clean up details on those you have. And this is the end-goal for the pluralist, as the collection of hypotheses and possible truths will eventually start organizing themselves into plausible arrangements; what is, in fact, the approach which John Stuart Mill's *Logic* bequeathed to modern science *in the macro*, which it still espouses today, and which, *in the macro,* it cannot avoid for every practical sense. Yet, *in the micro,* there is an underlying current of faith which James referred to as 'his earliest superstition,' that everything would one day shake out into a single governing principle. If you just found the right catalyst, all the hypotheses would suddenly become a beautiful crystal. If one were to take an inventory of living scientists, this 'micro' superstition would most probably dominate the motive that drove curious smart children into longtime scientific careers…only late in life accepting the more humble practical objective, and the *emergent* qualities of theoretical unification. The pluralist simply says that the collection of hypothetical truths should only resemble the world we are familiar with—both reality *and theory* will be emergent and organic. And while it neither ever crystalizes for long, each time uniquely, such crystals are not sloppy, simply ever-imperfect.

The 'deep realities' that we attempt to discover may well be true—locally—as descriptions of the universal principles, but from only one perspective, let us say, no more of a perspective than from the ambient of a termite or a song thrush. Each of the separate perspectives can be *true* nevertheless, and provable to a point. Pluralism sings loudly of academic tolerance and developing one's conversational facilities. It is decidedly *not supportive of a relativism* of the popular sort—which does leave everything sloppy—but a tough-minded relativity that will work hard at discovering the test criteria to prove someone else's point of view. This is the proper scientific mindset, a gaming that improves your own perspective drawings and your abilities to represent your own song,…that is, if you are in any way similar to a song thrush. The scientist who remains a Monist will spend most of their energies loading up one particular hypothesis and trying to prove, through a *tour de force,* that it qualifies as the best and highest organizing principle and catalyst to unify all others….for Monism, with its strict notion of a *uni*-verse as opposed to a pluriverse..demands this as the criterion of science. James would say this is merely *the criterion of engineering.* Engineering is to focus rational power on a single over-riding function. The space program *is decidely not* the oceanographic program—though the amount of rational energies –e.g. science—devoted to each may be quite substantial.

As noted, James the Pluralist was able to perform some miracles of conceptual unification far beyond what any Monist of the time (or after) would ever consider—even given the help of Einstein's great unifying equation. To announce that the 'materia prima' is *pure experience,* and that things and thoughts are necessarily of the same structure of reality is a model of knowledge from a scientific paradigm beyond the wildest ravings of any IT or New Age guru. [24] As a state description (i.e. of the pluriversal state) James is demanding a process meeting all the obscure requirements of the 'Tao.' Unfortunately, getting a grasp on James' *pure experience* is about as tangible as a good melody. I love the melody, but I wish I could get it out of my mind since it gives me no more of a grip on the nature of reality than any other pure and simple experience. This book and the two which follow, however, are attempts at doing something with the melody, and possibly incorporating it into a larger symphonic work.

Thickness

I first stumbled on the term "thickness" in Jacques Barzun's overview of James' philosophy[25]:

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[24] Note that the radical concept of 'pure experience' is *not the sophomoric unifier* that can do no further work (such as 'all electrons being instances of the same electron'), or that of Varro, proving the logical necessity of yet another Manichaeist polarity among dozens. James uses his unifying concept (a *material prima* of 'pure experience') to help draw more subtle differences and strengths in our ability to interpret, or 'draw' (draw out) what we are seeing—which is to say, the function of having a 'materia prima' at all is not for the sake of 'truth' (an egotistic way of asserting one's knowledge) but rather to enhance the ability to *act wisely,* and do further work. The knowledge component to the hypothesis is wholly secondary and almost irrelevant….which is how he can throw it out blithely and why we, on the other hand, react so violently to what we take to be his hubris. It is *our hubris* to think that mere knowledge assures right actions.

[25] *A Stroll with William James*. (1983) can be an especially helpful introduction for the non-philosopher to James, as Barzun is best known as a cultural historian and popularizer of large swathes of history-as-culture, as in *Darwin, Marx, Wagner* (1941), *Berlioz and the Romantic*

We know from his (James') own words that every philosopher's vision has a center out of which every one of his perceptions radiates. We have followed his glance as well as we could along these radiating lines, sampling as we did so, a little of his rich store of incidental wisdom. If at the end we ask ourselves how to characterize that central irreducible truth, I believe the clearest word we could choose would be THICKNESS. It was a favorite with both William and Henry. It stands for the intense awareness of multiplicity---in nature, in persons, in art, religion, and social reality. It is the opposite of the flight into concepts, which more than ever today threatens judgment, action, and the good life. For novelty arises, observations vary with perspective, the world—in short—to keep its thickness and reality must forever be reconceptualized and re-envisioned. (p.301)

   My only previous direct connection to James (that is, the only part of his work I ever used to quote) was his chapter on multiple realities, taken from the *Principles.* After taking in the *Principles* (getting, in fact, to Chapter 21, which was critical), I went on to read *Pragmatism,* having gone through *Varieties* years before. Taking the impacts of his methodology to bolster my own ideas, I hadn't drawn the tight connections between this method and Pluralism…nor had I ever internalized any of his specifics, i.e. his approach to consciousness *and its ties to "pure experience,"* which I had skimmed over, unconvinced and uncomprehending, in the *Essays.* All of this was simply confirmation of someone having similar thinking to my own. I had not been forced to truly *listen* and take each word literally.[26]

   Barzun calls *thickness* 'the central irreducible' of James' wisdom. It is Barzun, then, who pointed out this word as being, perhaps, 'the criterion of adequacy' for thinking. Indeed, he says this word applies as a key to both William and his brother Henry, whose novels demonstrate the 'intense awareness of multiplicity…'

   Thick, as Barzun describes it, is not exactly a state of multiplicity, but an awareness of multiplicity *that demands shifting perspectives.* For a philosophy this means an ontology of being, a conception of existence. Now it is fine enough to provide some all-inclusive concept of being, but if so, you must also include a concept of how it could ever be known or verified, and this is an epistemology—where 'knowledge' will consist of a participatory function, an ability to do work through that knowledge. This consists of having some control of its forms of being and processes of being….for this is essentially its verification (to which we might now add, its *pragmatic essence).*

   James' use of the metaphor 'thick' was chosen to contrast with the particularly 'thin' philosophies he saw all around him, which attempted to explain in volumnious detail a vary particular subset of reality, while claiming its universal truth. Barzun himself characterizes 'thin' as *'the flight into concepts, which more than ever today threatens judgment, action, and the good life.'* This is the writing of an artist. Barzun has bundled into one simple-sounding statement the entire discussion differentiating concept from percept, and adds his own interpretation of James' stroll through life, his mode of judgment, action and feeling of fulfillment. A little package of wit that rolls off the tongue of one's mind while debunking rationalism. Yet this is Barzun's take on James. We must keep in mind that the professor never said any of this outright.

   In effect, as Barzun notes, the term *is epistemological*. Any philosophy is in its essence a methodology for drawing the truth from reality. The claim on philosophy is for an interpretive

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Century (1950), *The Use and Abuse of Art* (1974), *Begin Here. The Forgotten Conditions of Teaching and Learning* (1991). Rather unexpectedly, he constructed his *stroll* as if you were walking with the old professor, simply inter-larding nearly every paragraph with substantial quotes from James' longer works and letters. To keep his own book from seeming overly-academic, to *hear* James speaking through his works, Barzun only separates out the James' material from his own contextual segues by single quotation marks (in the fashion of James' own writings). Quotes from other philosophers and writers are in normal double-quotes, set apart, and footnoted, but the James' quotes, which come to take up three-quarters of every page, are not footnoted at all, but listed in an Appendix, page-by-page and paragraph-by-paragraph, mapped to the actual sources in James. One hardly realizes after the introductory chapters that it is James, and not Barzun speaking.

   [26] If it weren't for a challenge put to me by my brother, Ray Jackendoff, I would never have begun tying together all the pieces of James to try understanding him *literally*…nor would have attempted this book. As we argued over my use of language concerning cognition, which is my brother's professional forte, I always supported myself with one or two counter-arguments from James. At one point I risked saying that James already arrived at all my conclusions concerning cognition, and Ray basically said that if that was so, then why not introduce my work as an in-depth analysis of James. Frankly, no one is interested in any of *my* personal thoughts in philosophy….everybody claims they have unique thoughts, after all. What *some* people, and the people who generally matter most, want to read are new thoughts about old people, especially well-respected but historically misunderstood people. Thus, while I intuited his answers as applying to my personal arguments, I was only goaded into sitting down to truly tackle James word-for-word.

methodology that might be sufficiently generalized. The tell-tale evidence of the 'thickness' or 'thinness' of a philosophy lay in the details. Most philosophies to be considered robust only needed to point to a single belief set in James' 1869 list, to show that nothing in that belief set could serve as a counterexample. As interpretive methodologies, every philosophy will establish itself by demonstrating that counter-examples are merely secondary artifacts that may be shelved as having little or no impact on the explanatory coherence of the whole. But what constitutes *the whole*?

What frustrated James most was that academia spent its energy arguing robustness at this level…as if the convention of shelving counter-examples was not only methodologically valid but not subject to question. A "thin" philosophy concerned itself with only one level of reality—covering a single relation of belief-sets—to the exclusion of the rest, let alone the permutations of their relations.[27] Yet Barzun reminds us that it is not in the *number* of relationships that an interpretive methodology points to, but *the constant shifting of perspective,* the creative dynamic of a philosophy; for a philosophy is meant to be a representation of the world *that can in fact be mapped back to the world.* Barzun completes his statement concerning James' 'thickness' with the phrase, "the world…to keep its thickness and reality must forever be reconceptualized and re-envisioned." (Idem) Reality itself is constantly shifting in perspective and so a mapping of *this 'thickness'* must carry with it a continual allusion of that changefulness, a perpetual instability always reminding us of its origins, perhaps even *threatening* to break loose.

The Fechner Example

James develops the concept of 'thickness' in Chapter IV of *A Pluralistic Universe*, his Manchester lectures in defense of Pluralism. The chapter in which he does this concerns itself with the 19th century philosopher-scientist Gustuv Theodor Fechner. Here too, in order to understand the term which plays such a central role in this book, we need the titles of the eight separate lectures:

I.   The Types of Philosophic Thinking
II.   Monistic Idealism
III.   Hegel and his Method
IV.   Concerning Fechner
V.   The Compounding of Consciousness
VI.   Bergson and his Critique of Intellectualism
VII.   The Continuity of Experience
VIII. Conclusions.
APPENDICES
    A. The Thing and its Relations
    B. The Experience of Activity
    C. On the Notion of Reality as Changing

My claim that the term 'thick' plays a central role in the book is warranted not only by its frequency, but by its usage as a criterion by which a philosopher and their philosophy may be judged. I am in no position to discuss Fechner, so it is just as well to let James speak here. Fechner is a bit wierd, even for today's New Age "philosophers."[28]

> "Fechner likens our individual persons on the earth unto so many sense-organs of the earth's soul. We add to its perceptive life so long as our own life lasts. It absorbs our perceptions, just as they occur, into its larger sphere of knowledge, and combines them with the other data there. When one of us dies, it is as if an eye of the world were closed, for all perceptive contributions from that particular quarter cease. But the memories and conceptual relations that have spun

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[27] Most such philosophies draw their apparent strength from pointing to a core *relation* or set of relations between two or more realms of experience, giving a hint of *thickness*. Their strength is in explaining away our normal confusions and frustrations by pointing to a hidden relationship as the ontologically *real—the key to interpretation.* Life at its surface is implied as ephemeral, and may be conveniently shelved by using this key. Many examples of such 'thin' ontologies exist outside of the science offering a modicum of explanatory consistency, e.g. astrology, shamanism, numerology, etc.

[28] which, to be fair to the human spirit, must include mental minataurs such as L.Ron Hubbard among its luminaries.

themselves round the perceptions of that person remain in the larger earth-life as distinct as ever, and form new relations and grow and develop throughout all the future, in the same way in which our own distinct objects of thought, once stored inmemory, form new relations and develop throughout our whole finite life. This is Fechner's theory of immortality, first published in the little "Büchlein des lebens nach dem tode,' in 1836, and re-edited in greately improved shape in the last volume of his 'Zend-avesta.'

"We rise upon the earth as wavelets rise upon the ocean. We grow out of her soil as leaves grow from a tree. The wavelets catch the sunbeams separately, the leaves stir when the branches do not move. They realize their own events apart, just as in our own consciousness, when anything becomes empathic, the background fades from observation. Yet the event works back upon the background, as the wavelet works upon the waves, or as the leaf's movements work upon the sap inside the branch. The whole sea and the whole tree are registers of what has happened, and are different for the wave's and the leaf's action having occurred. A grafted twig may modify its scion to the roots: —so our outlived private experiences, impressed on the whole earth-mind as memories, lead the immortal life of ideas there, and become parts of the great system, fully distinguished from one another, just as we ourselves when alive were distinct, realizing themselves no longer isolatedly, but along with one another as so many partial systems, entering thus into new combinations, being affected by the perceptive experiences of those living then, and affecting the living in their turn—altho thoey are so seldom recognized by living men to do so.

"If you imagine that this entrance after the death of the body into a common life of higher type means a merging and loss of our distinct personality, Fechner asks you whether a visual sensation of our own exists in any sense *less for itself* or *less distinctly,* when it enters into our higher relational consciousness and is there distinguished and defined.

"—But here I must stop my reporting and send you to his volumes. Thus is the universe alive, according to this philosopher! I think you will admit that he makes it more *thickly* alive than do the other philosophers who, following rationalistic methods solely, gain the same results, but only in the thinnest outlines." (ibid., pp.170-173)

He goes on to show that you can reduce *the inner logic* of Fechner's "philosophy" to the inner logic of his co-faculty member Josiah Royce, at Harvard—who he criticizes as being *right, but uncharacteristically thin.* His chapter on Fechner builds on the idea of the required 'thickness' of a philosophy of existence from his description of Hegel, who all his listeners at the time were familiar with. Hegel is James' model of an extremely robust, yet "viciously intellectual" attempt at 'thickness,' attempting to harness every aspect and hierarchy of experience under a single conceptual mechanism, whose power is in his emotional grasp—that power grasped by his readers emotionally; whose followers and enemies, proud of their intellectualisms take only the conceptual mechanism, reducing all the life in Hegel to conceptually 'thin' and poverty-stricken versions of the world.

What I chose to include of Fechner here was merely his perspective on *the individual vs the universal whole.* Fechner was, as James describes it, a monist rather than a pluralist. As the section quoted alludes, for him there was a single world-spirit. But there is much more, and what I have excluded from James' chapter on Fechner is worth a book of its own…and to begin summarizing James' own tenderly careful summary would be an injustice to this massive and energetic mind. Fechner's own contributions to 19th century science (he lived from 1801 to 1887) in chemistry, physics, mathematics and psychology were, for a single individual, vast. That he eventually became known as a philosopher of a particularly religious and cosmological stripe, and was, at the time James wrote these lectures in 1909, as relatively unknown as James is today should be quite telling. It is tempting to include James' entire chapter, but I will not go any further into Fechner, or I should be driven to recast his vision, and write that same book

that James wished to write…. as he himself suggests. Fechmer prompted James throughout his own scientific and philosophic career. *THICK* is attempting to write that same book for James.

Having just accused myself of reductionism (following Barzun's lead), I will now attempt a crude hypothesis as to explain *our* central term, *thick.*

> 'Thickness' may be applied to a description of something that places several discrete realities together into a sandwich that can be easily bit, chewed, and tasted.[29]

This hearkens back to early James, 'The Perception of Reality' article (1869), and agrees with both applications of the term 'thick' to Hegel and to Fechner in *A Pluralistic Universe* (1910), published the year of his death.

The down-home analogy to a sandwich breaks free of the metaphor of *mapping* reality, of looking for a function that allows you to map any part of experience to its appropriate location in your scheme, and likewise project from any point on the scheme back to its place in reality. It is the insistence on a mapping protocol that James puts down as 'vicious intellectualism,' for the 'viciousness' is in its hubris—the vanity that asserts we can theoretically possess a complete projection of reality. At most we can derive a conic section—that this is still 'thin.' Rotating the conic section of a plastic toy or even a complete human being will allow us to project quite a bit of it, but will not tell us the uses to which the toy or the human being may be put. The metaphor of the reality sandwich lets us place each of James' seven worlds, or belief set classes into permutations and combinations—sampling differences in taste as we load on the lettuce or put the tomatoes against the bun. This is *not* a metaphor condusive to linear projections.

James' criterion of adequacy for *any description of anything* is that it maintains the variability and taste of reality *which is by its very nature, sandwiched.* There can be no **adequate** representation of **reality** through a discrete linear relationship; though a discrete linear relationship is perfectly adequate for a **concept**. I will repeat here what we already quoted regarding percepts and concepts above.

> "The great difference between percepts and concepts is that percepts are continuous and concepts are discrete. Not discrete in their *being,* for conception as an *act* is part of the flux of feeling, but discrete from each other in their several *meanings.* Each concept means just what it singly means, and nothing else; and if the conceiver does not know whether he means this or means that, it shows that his concept is imperfectly formed. The perceptual flux as such, on the contrary, *means* nothing, and is but what it immediately is."[30]

Our issue concerns the statement about 'the perceptual flux,' which 'is what it immediately is.' *Immediate* is the key to understanding what he means, for by 'immediately' James implies the entire realm of discussion on *mediation.* (Think 'media' and the entire corpus of Marshall McLuhan's works on media and mediation, including the idea of technology as the extension of man and the human mind as the mediator of reality).

> "The perceptual flux […]*means* nothing, and is but what it **immediately** is."

'Immediate' is the essence of the *percept;* and by this we can now assume that it is the *percept* that is essentially 'thick.' It is the *percept* that can also be interpreted as 'sandwiched'. The active process of converting the percept to a concept is the mediation, which is central to our description of a philosophy. It is this taste—the mediation process-- that McLuhan will make central to everything, but it is the processes of tasting that James is most concerned with.[31]

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[29]To be 'thick' will be to produce a 'reality sandwich' –a concept too tempting for the tongue-in-cheek! Thus we might launch a whole new future for Rhetoric, with a chain of charter schools teaching the societal arts of delicatessen politics: "Filosophers of the Phuture" –trained to concoct the tastiest sandwich for the realities of your choice, specializing in "Subway Bombast." I am obviously aware of the danger and callousness of this definition to scientific taste, and qualify it further in the text above.

[30] p.48, *Some Problems.*

[31] The discussion of taste, as well as McLuhan's vision in regards to that of James, is found in my companion volume to this piece, *Survival on a Logically Dense Gameboard: a Logic of Laughter.*

But now we have a core difference between the sandwich analogy and the mapping/projection one—for in turning a percept into a concept is to transform a sandwich into a new form. But the only *single* quality that addresses 'each concept means just what it singly means, and nothing else' is its *taste*, that is, the very unique difference between a chicken salad sandwich to a roast beef with horseradish on rye –taste as it might be differentiated in a gourmet magazine. Our hypothesis is that the *thickness* of reality is best pictured by seeing James' percepts as made of sandwiched belief sets. And more precisely, in forming our concepts we are often only taking *slices* of belief sets to make our conceptual sandwiches— and it doesn't much matter what is in the sandwich either, as most of what you choose at the deli counter to put between a roll will support digestion equally well—that is, the digestive breakdown into vitamins and minerals and conversion to waste is simply transforming the complexity of belief sets to a different form of complexity. The criterion of taste and of truth is another matter—the digestive tract can handle all sorts of garbage that we never seek to eat, and will process all sorts of poisons to the system before shutting down.

Our hypothesis concerning 'thick' is relative to the percept-to-concept transformation process, as a description of the *mediation* of the percept in flux. Yet to get at this transformation process it seems to me that we must speak more directly to the nature of the flux itself (specifically the *perceptual* flux), even though James has insisted it 'means nothing in itself….'(…beyond what it immediately is.)" That this entails wandering into ontology (the 'philosophy of being') or what is considered 'metaphysics' should not be a surprise. We shall take up our perception of the flux in the next chapter, assigning it the convenient name of "St. Augustine's Plenum" so that it can be put to further work

Before going there, however, we will make two significant side-trips. The first is to address the more popularized William James that the 'Big Book' of Alcoholics Anonymous (and all derivative 12-Step recovery programs) recommends to its worldwide readership. The second is to finish what I could not finish in the *Introduction* until the concept of Pluralism had been grasped—for there could be no getting *beyond* James if we continued in the mode of seeing logic and science as our single over-riding criterion of what can be discussed.

Varieties of Religious Experience

Reading *Varieties of Religious Experience* alongside the other works it becomes clear that it is a description of the direct impacts of his pluralistic ontology back onto everyday common experience. *Varieties* explores the ways in which this thing we call religion is experienced, or felt in the psychological realm, where the latter can be considered from the standpoint of pure science. Thus, this book should serve as a bridge between the pure logical realm where philosophizing begins to the facts of life and living. Here, then, we should expect to find another perspective on the *pure experience* that a few years later he calls the 'stuff of the universe'[32]

All of this is, of course, part of a fully consistent philosophy, one which should probably be taken in its entirety and not piecemeal. Unfortunately he states in his introduction to *Varieties* the pages the reader can turn for his conclusions, and avoid reading all the supporting data and arguments. His consclusions are straightforward enough, and he probably felt that he'd supported the logic of them well enough in his previous book *The Will to Believe (and other essays in popular philosophy)* (1897). Published not long after his monumental *Principles of Psychology,* he had already distinguished himself as a hard-headed scientist as well as a maverick of modern rationalism. It would take Einstein's revelations to shake philosophers out of their rationalist torpor, but not far enough to accept James' embrace of popular simple-minded credulity as being ontologically closer-to-the-mark than any dominant intellectualizations.

As best as I can state them (summarily speaking), his conclusions circle around a relatively incontravertable statement that the realm of cognition (i.e. mind as connected to the physiology of the sensory mechanism) is vast, going far beyond that available to consciousness, and certainly to reason. Cognition works as an outcome of life forces themselves; it is not directly governed by reason and consciousness.

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[32] I will repeat James: "'Pure experience' is the name which I gave to the immediate flux of life which furnishes the material to our later reflection with its conceptual categories… *" Essays in Radical Empiricism*, p. 94 (See above, p.**Error! Bookmark not defined.**)

The argument for religious experience lies in the fact that the work of cognition, somewhere and somehow within the recessed structures of the individual organism seems to be able to interact with a realm of existance not accessible to reason—that is, interact with a 'realm of existant fact' that is otherwise (outside of our individual self) *similarly* in touch with the 'physical' realm we experience. It is inconsequential to James where and how or what we call this realm of outer connectedness; he is unconcerned if there be one or more such realms, a unified eternal essence or simply another category of complex structures of existence. All that his framework is arguing is that such a realm would seem to exist, and that *religious* consciousness seems only to be an intuition of this. From the outset he has laid aside the historical or anthropological genesis of religion as an issue of his book; the scope of *Varieties* aims to show that that subliminal cognitive activity can be set in motion by the will to *access this realm.* If such were the case, and positive results were demonstrated, there is no further need to rationalize the cause of religious belief from primitive superstitions and fears.

So in support of the claim that such a realm exists (which we generally consider religious), the book carefully arranges the masses of data that can be brought to bear from autobiographical accounts throughout history, as well as in contemporary documented medical records of pronounced and specific physical effects, brought about to cure particular medical conditions, i.e. physical ailments and diseases that would not yield to any known medical treatment. That is, when so-called 'mind-cures' are sought for incurable diseases or conditions *of any known type*, a statistically significant percentage are reversed, while the same percentage of reversals *do not take place unless the 'mind-cure' is sought*. This, to him, seems adequate reasoning to explain the origins of the religious attitude; it then is necessary only to show that the wide range of religious beliefs and attitudes can be covered by such an explanation.

To accept the data that faith-healers and believers in mind-cures (the health benefits of meditation practices, positive-thinking, etc.) adamantly profess does not mean to accept their explanation of what is taking place. Whatever that agency, for most of us the 'miracle-factor' is intact, and condemned by rationality. James, as we have already seen considers the claims to credibility as falling into conflicting belief sets within any given individual—and that 'rationality' is one of them (differing in measure between individuals).   The 'miracle factor,' however he ignores, for the purpose is *only to show that particular effects,* which is to say specific changes in experiencecd physical reality *can be brought about by interaction with something through subliminal activities of cognitive system* through acts of cognition!

James only cares about the data, and proposing an explanatory framework around it that should satisfy science. That explanatory framework is what we've glanced at above—a pluralist conception of otherwise 'universal' principles, of which consciousness itself is an artifact. But the framework seemed too obtuse and over-the-top for most Enlightenment-bred academics of his time. My premise is that his arguments are better suited, a century in waiting, for our time.

It is here that my own book will also change its course. For our purpose is to take on James as a partner and attempt to keep going where he left off. Specifically, in line with *Varieties,* the question is in amplifying that framework. What could be going on between the conscious willing and the activities taking place just below consciousness and that 'outer connectedness?' In terms of the metaphor of this book, that outer realm which James seeks to demonstrate is the same realm we are endeavoring to plumb by "harnessing chaos."

3. 'Chaos' vs. "Law and Order"

James pluralism is mapped to a postulated definition of chaos. The failure of pluralism is tied to the governing paradigm of a unified science. The origins of this paradigm are examined as they applied to James' era and into the 20th century. Issues concerning the choice of terms surrounding "relationship" critical to any idea of 'order.'

Chaos :> Law <: Order

A vast realm of scientific work has accumulated around this set of terms in the latter half of the 20th century, before James. At the present time, two decades into the 21st, the dynamic connecting the terms has calmed down, and the excitement over the discovery of new universals—new 'order from chaos'—seems to have slackened, and given way to fleshing out the details of the terms that describe the principles connecting order to chaos.

The following discussion is meant to precede the arguments of modern Chaos Theory, that is, to show that much of it may be reconstructed from James' intuition and logical suppositions, but with something added that I believe modern Complexity Research (the protégé of Chaos Theory) is lacking—for many of the same reasons that James battled his contemporaries over the idea of a *universe* vs a *muiltiverse* or *pluriversal perspective.* And so, the purpose of this chapter becomes to continue the discussion of pluralism as a possible solution to the confusion over chaos vs order, through fundamental principles.

James was, of course the quintessential chaoticist of his time. His insistence on the essential *reality* of a multiverse should not be considered *per*verse…for his search was guided by simplicity and elegance—a symmetricty and Occam's Razor that guides contemporary science. He also assumed *things* and *thoughts* become complex and muddy very quickly –due to thickness—and yet his criterion of adequacy was that in the end, explanatory coherence of a theory in science or philosolphy must be *thick.* In terms of Chaos Theory, the principles must be applicable at any scale, universally, one might say almost childishly and anthropomorphically as in Fechner.

Connecting the Terms

I will trust James as a guide into *the perceptual flux* of chaos analysis, introducing the phrase to be used for our initial definition of "chaos" in line with his Pluralism:

"a situation in which multiple sets of ordering principles are simultaneously at work."[33]

This is *not* a definition to be found in James, but I shall argue it as a rough version of what James is after—again, it is my own objective and not James' to tie 'chaos' down. It shall become evident why James had neither reason to do this, nor approach things from this angle. From a Jamesian standpoint there is no chaos anywhere beyond what we are flying through at any moment of our lives. We are created from chaos and there is no need to suggest we 'return' to it …we are simply 'in it,'…if 'it' were a state to which 'always' might apply. Living amidst an assumption of chaos, our lives are witness to appreciate and channel an essential and artful orderliness—and the role of science is continuous with the role of life. For someone like William James this is easy enough to say, to believe, and to live. For the rest of us, it is rather extreme sports.

Let me say from the outset that the chapter title implies a discrepancy between chaos, law, and order, but it is *rather* the intention of this chapter to show that all three terms may be intimately tied together as three facets of James' Pluralism. The above rough, working definition of chaos as "*a situation in which multiple sets of ordering principles are simultaneously at work*" speaks directly *against* any interpretation of chaos as opposing order, but merely running counter to *orderliness*.

James, would say we live in an ordered universe, except that there are more than one brands of order. He consistently calls it a *pluriverse,* or *multiverse* rather than a "universe;" Most people would say this admits to chaos—and indeed, this is the case but needn't be a problem if we accept the definition suggested here.

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[33] If you remain unsure about letting me define certain terms as I wish, you may turn to a comparison with the standard definition below, p.31 ("The Simplest Refutation").

'Order' implies an absence of *chaos,* but our definition would subsume it (order) under 'chaos,' where it is a situation having "a set of one" governing principle, or the most commonplace condition which allows for a rough synchronization of two or more sets of organizing laws coexisting 'in equilibrium.' Our definition is economic; it links chaos, law and order while allowing continuity between these three terms, even under the most disorganized and chaotically "lawless" of conditions.

The goal here is to show we simply need an ontology that can accept n-numerable ordering principles as a standard feature, where <u>order</u> and <u>law</u> are secondary to the strategy of "playing the laws." That is, the actual 'ordering principle' is methodology rather than *law* or any fixed *order,* though it includes a preferred protocol of steps.

This would be profound…at least it *sounds* profound. On its face (its surface-reading) it says we are after a methodology to substitute for the term 'principle' which alludes to our notion of 'law.' Clearly the ontology is that of James' Pluralism—but nowhere does James ever allude to the fact that Pluralism implies a *methodology* rather than a structure. Pluralism has somehow mutated into an ordering principle.

And so we have essentially dispensed with all the key terms in our chapter title. Our concern is with Pluralism, whose import I should not have been able to stress had this been our chapter title. Indeed, we shall continue to have to speak of chaos, law, and order, but it will be within this new framework.

I have already intuited that the methodology shall be a strategic game—a game that is potentially more stable than the ordered states it attempts to discover and stabilize, where the adage "it's how you play the game" is all that really counts. It is not in winning or losing a set that you succeed, but in keeping the game going. Sustainability is the final judge…and finding a strategy for survival to keep the umpires employed. [34]

The Simplest Refutation

The above definition suggests we call any situation *chaotic* where multiple sets of ordering principles are simultaneously at work…which is what Jamesian pluralism requires as a *consistent* state of affairs. Rejecting Pluralism, of course, 'chaos' has the sense we are used to, a meaning which is in direct contradiction to 'order.' The implication being that 'order' exists in the absense of 'chaos.' My definition allows them to co-exist…but a coexistance that can only take place in a pluralist setting in which we have just seen, predisposes everything to chaos.

The refutation is that by defining chaos in this fashion makes the objective of "harnessing" chaos moot. It is automatically brought into control by defining its context in a Pluriverse—chaos, being the default nature of 'order' I have cheated. The objective is faulty…e.g. false. That is the substance of the refutation. Either we accept chaos as a relevant term in a universe, or we must drop either the definition or the contextual requirement.

Let us drop the requirement for Pluralism and accept the common definition to be found in our books today. Here is what my old hardcopy Random House Webster's College Dictionary (1992 edit) has to say:

> **cha-os** [kā′os] *n.* **1.** a state of utter confusion. **2.** any confused, disorderly mass. **3.** the infinity of space or formless matter supposed to have preceded the creation of the universe. **4.** *Physics, Math.* **a.** the nonlinear, deterministic behavior of certain systems, as the appearance of strange attractors or fractal structure in graphical representations of a system's evolution. **b.** the discipline that studies such behavior. **5.** *Obs.* a chasm or abyss [1400-50; late ME < L < Gk; akin to CHASM]

You will no doubt notice the introduction of the late 20th century technical sense in [4a], above, which adds an odd twist to the old monistic sense. Without the word 'nonlinear' it would appear that we were speaking about a rather ordered governing principle with "a deterministic behavior" –although the words describing such behaviors happen to be "strange attractors" or associated with fractal *structures.* So we find that the standard definition leans back towards the introduction of a *different class of laws.* This is, of course, the realm of Chaos Theory, which has discovered a new realm of principles of relationships of scale and process structures which seem to be ubiquitous and may govern a truly non-pluralistic universe, governed by a unified source of fundamental laws of nature. All of course, which is the aim of science.

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[34] As I shall show in the second part of this book, the notion of an ontology of sustainability is more general than 'survival,' which becomes a special case for the *ideosyncratic*, a term we'll derive from a very odd notion of James' concerning, and allowing for, the logic of solipsism.

My definition stands refuted by modern science. Chaos Theory tells us that *the rules of* chaos are continuous with those of *order*. There are principles that cause us to interpret things as chaotic, but in fact there is order beneath it.

We still need a way to discuss 'chaos' common-sensibly, without the interposition of strange attractors and fractal surfaces. To elucidate James and his concept of 'thick' I will therefore let our straw definition stand, so that when we speak of 'chaos' we are in fact pointing at one or more artifacts of James' version of Pluralism (not the pre-Socratics' version)

Making Connections

Our straw definition of chaos is composed of several terms that deserve extremely close attention. Note that the definition is by means of a sentence that *connects* a number of ideas into a unique relationship with one another —merging pre-existing concepts conveyed as independent terms. The relationships are our target concept, which is essentially a description of the Jamesian flux:

"*a situation in which multiple sets of ordering principles are simultaneously at work*"

Each of these terms in fact must be addressed, and adjusted somewhat, to accept their new relationship under a Pluralist approach—specifically connections between the words 'situation,' 'multiple sets,' 'simultaneous,' and 'work' which are used to connect the three subject terms [chaos, principles/law, order].

The 'straw definition' is more than straw—its justification obligates me to a rather wide swath of effort. This book is specifically focussed on *chaos* (artifacts of a pluriversal order) and the ways in which we 'harness' it. It will take another book to consider our alternatives for the same situtation from the perspective of *simultaneity,* while another perspective must develop strategies for *work*.

Each perspective occludes constituents of the other book, which are transparent to new aspects of the problem—so we must deal with *chaos, work,* and *simultaneity* separately.

Our current problem is with *pluralism.* It would seem to provide us with our intuitions regarding chaos vs. order. We will consider these intuitions briefly, and move on to the biggest problem for Pluralism, which is *making connections.* For as you can readily see, our definition of 'chaos' depends on the coexistance in a given setting of many things that interact in unforeseen and complex ways, like bumping cars. We must consider what it means for multiple things to coexist, work side-by-side, or 'make a connection.' For the very nature of a description of the Pluriverse must turn on constantly shifting relationships, brief and tangential but functional associations…extracting such percepts from an otherwise chaotic context to make concepts, and words and tokens of them. Indeed, the balance of this half of the book is after a coherent way of speaking of relationships in a Pluriverse, which is our first step in 'harnessing' our intuition and instincts regarding chaos. Part 2 will discuss a number of 'harnesses.' Wherever I can identify them, these will be linked to similar principles in modern chaos and complexity theory.

Pluralism entails chaos as a default condition

Some Problems of Philosophy is dedicated to Charles Renouvier,

> "…one of the greatest of philosophic characters, and but for the decisive impression made on me in the seventies by his masterly advocacy of pluralism, I might never have got free from the monistic superstition under which I had grown up." [35]

This quote is rather interesting, as James is asserting that in 1869, when he wrote "The Perception of Reality," he was still what he calls "a monist." It also makes clear that Pluralism was not a Jamesian invention, but was already one of the many philosophies and ideologies being bandied about as we entered the 20th century.[36]

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[35] frontispiece Dedication to Renouvier, quoted from p. 165

[36] It is, for the academic philosopher, one of the most ancient of philosophical dichotomies being argued over in Athens when Socrates was still a child growing up. Parmenides' arguments, supported by Zeno's paradoxes of the infinite represented the approach to monism while Anaxagoris and Empedocles argued for different versions of materialist pluralism. The absorption and transmutation of this dichotomy into the Transcendentalist version of Monism (or any of the other Unitarian approaches) that James was combating is essentially a history of western philosophy.

A belief in Pluralism (and a "pluriverse" or "multiverse") is not what science fiction film writers conceive of as a "parallel dimension." It is rather an acceptance of the *same* world governed by *multiple* sets of laws, or principles of order that operate in different settings, possibly overlapping and simultaneously exerting separate and independent power over choice and action. To the pre-Socratics it was already fairly clear, and subject to debate, that the gods behaved according to a *separate* governing principle, and might in fact have further ideosyncratic laws applicable to their different families of origin. The very separation between God and his creation implied pluralism, as did the substitution of the realm of Platonic Ideals for the rationalist's version of heaven.

James marvelled long after he wrote of the ubiquitous nature of discontinuous belief sets, that the rational conception persisted of continuous order, in the face of behavior protocols that altered with a change of focus or attention seemed a subconscious oversight—a well guarded superstition.

Competing Principles

Yet to insist that the coexistance of multiple competing principles *must entail a* pluralist outlook is absurd. Situations of competing laws and principles, of egos butting heads, of traffic jams and wars are everpresent. And as for a *system,* multiple competing principles are common to nearly any computer application, which is an artform of subroutines and complex coordination over-riding or surfing the competitive nature of resourse and attention-sharing.

On the macro-scale one thinks of the integrated layering of applications running a manufacturing process facility—combining, cleaning, analyzing, extruding, coloring, injecting, forming, testing, packaging, managing inventory and skus, pallets and trucks, as well as accounting and paying and being paid and managing everything and everyone involved. Don't all of these entail multiple sets of rules handled in entirely different envelopes and cycles and scales of operations? We have no problem here, for there is a unifying law—a set of protocols for *integrating* all the activity—prioritizing the pulling and pushing and tugging of different independent parts towards the organization's end goals and bottom line. It may *look* like it is governed, after all, by such purposes, but I will tell you from experience that it is not trivial to move such a leviathon from one mainframe platform to another, especially when it represents cobbled systems that have forked and merged over thirty years or forty years of corporate changes. These can include organizational transmogrifications swallowing whole companies and their products, merged divisions, policy and stock redefinitions that may never have fully represented the day-to-day operations. Indeed, many "modern" systems actually represent ecologies that are kept running by cyclical tweaking rather than "centrally run programs" in their original sense. Parts of such "systems" must, in fact, be co-*operated* through human protocols with plenty of oversight to ensure consistency. The "system" works through the pragmatic proof that the organization stays in business…and only the auditors and IT mavens maintaining who realize it actually corresponds to our straw definition of 'chaos.'

Let's consider the appropriateness of the same definition (""a situation in which multiple sets of ordering principles are simultaneously at work.") from the standpoint of chaotic Nature. Schoolchildren are taught about nature as based around "ecologies," and *ecological principles*. Here we also find highly interactive processes that are constituted by multiple sets of laws, i.e. ordering principles governing the choice and actions of constituents of an environment (a relatively bounded locale), all of them operating in tandem. The human body is an ecology, in that many, if not all of its systems depend on micro-organisms, bacteria, that lead independent lives of their own—in a strange symbiosis like that of the fish that have evolved to keep the teeth of sharks clean.

An ecology can be said to have structure—but it is not exactly one we could go and write a Management Information System to handle; it is not totally bounded by a governing protocol. Anything could tip the balances and set it haywire—losing equilibriating inter-relationships, setting some members off to chew each other up or letting whole members of a species stranded without nourishment.

So could dis*equilibrium* be called "dis*order*"? We don't exactly know what the *order* was, for there were multiple ordering principles governing the ecology….and yet the ecology has a continuity and stability that we can observe as being ordered. To take the question further, "disequilibrium" is not necessarily *disorder* at all, for the slow death of a lake or forest may be hardly noticeable, and often takes place in a gradual if stepwise fashion. On the other hand, the rapid dissolution of a state of equilibrium through a catastrophe may not be chaotic or even disordered for longer than a few instants, and then only

at local points. A flood or fire or blast quickly alter the state from one equilibrium to another, and it is only the passage between those states (which may be quite local and short-lived) that might display what we'd recognize as "chaos." Yet even then, being immediately inundated under a broken dam, or a mud-slide, or going up in flames is a highly directed, one-directional affair can hardly be considered chaotic at all.

Actually, the straw definition will never *look* like chaos to us, when the multiple governing principles are *co-operating*—even without considering it cooperation, since they are only aware of their own relationship, and adjustments of their behavior (based on an independent set of laws) to some overall fluctuating *order.* Our standard interpreation *Chaos,* in this case, is a measure of a lack of co-operating the local, individually sensed *order of things.* This is not an ordering principle, but a perception of 'order' which may or may not be correctly represented or interpreted, but may work nevertheless.

Are there states of maximum disorder?

What could the idea of maximum disorder entail? How could we compare one level of disorder to another to describe a "maximum" in the first place. "Maximum" in such and such a given space and time? Couldn't you always add another straw..? ..mightn't chaos, this lack of co-operation, be infinitely expandable?

We've seen what "chaos" is—that is, how we interpret it. To define it simply as a quality of 'order' (i.e. its relative 'disorder') has turned out to be elusive.

The 3rd definition quoted from the dictionary above provides an alternative to a comparisoin with 'order,' and that is to consider it an alternative to *anything at all*—for the old and familiar concept in the Bible considers 'chaos' as a synonym for the void, a topic we shall take up in a later chapter.

But there has also been another way to look at 'chaos,' and that is as a measure of *control,* specifically an inability to lay hold of anything to mitigate the state or process of disorder. The 'control perspective' is tied to the idea of ordering something, putting it 'in order.' [37]

If our common-sense interpretation of 'chaos' (even in a non-pluralist sense) is taken as a measure of lack of independent co-operation in the maintenaince of an "order," we not only have to consider the independent perception and representation of that order, but the inability inability to *distinguish* what it will take to bring a dynamic state back into a relative equilibrium (that is, to one's perception of order).

This is subjective—it depends on one's ability to isolate components that may be leveraged through one's own behaviors; in this case we have decided to *operate things ourselves* because all the various co-operations have broken down.

The subjective nature both depends on one's concept of the order and function of the local state (environment) you are looking at as well as the technologies you have at your disposal to distinguish disruptive factors and "lay hold" of them, otherwise *ordering the chaotic state behavior.*

But this is the problem met in our earlier rebuttal. Once we are defining chaos in terms of *work to be done,* as a boundary condition in our ability to control it…whether we are trying to organize it and put things in order or simply adjust our own behavior to maintain a fluctuating steady-state, the very idea of having tools to "harness chaos" is an oxymoron. If chaos *can* be harnessed it should no longer be classified as chaos.

Chaos from Over-Coordination

The following is a thought experiment of chaos-in-the-making. It makes no difference whether we are in a universe or a pluriverse, for it takes place in fantasy providing a way to appreciate what the

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[37] It is relevant here to consider the swarm of common-sense analogies attached to the term "Order." My same old edition of the *Random House Webster's College Dictionary* (1992) provides us with: —*n.*. an authoritative direction or instruction: command. **2.** the disposition of things following one after another; succession or sequence: *alphabetical order.* **3.** a condition in which each thing is properly disposed with reference to other things and to its purpose; methodical or harmonious arrangement. **4.** formal disposition or array. **5.** proper, satisfactory, or working condition. **6.** state or condition generally: *in good working order.* **7.** conformity or obedience to law or established authority; *to maintain law and order.* **8.** customary mode of procedure; established practice or usage.[……] **19.** a body or society or persons living by common consent under the same religious, moral, or social regulations [……] **23.** a written direction to pay money or deliver goods, given by a person legally entitled to dispose of it. […….] **30. a.** a special honor or rank conferred by a sovereign upon a person for distinguished achievement…..—*v.t.***31.** to give an order or command to. **32.** to direct or command to go or come as specified: *She ordered them out of her house.* **33.** to direct to be made or supplied: *to order a copy of a book.* . **34.** to prescribe. **35.** to regulate, conduct, or manage. **36.** to arrange methodically or suitably. **37.** *Math.* To arrange (the elements of a set) so that if one elemen t precedes another, it cannot be preceded by the other or by elements that the other precedes. ….. **49. to order**. according to the purchaser's requirement or stipulations.

question of "maximum disorder" entails. Indeed, after reading the story it becomes clear that one could embellish it ad infinitum to obtain essentially the same results. Chaos can be grasped as being *thick* in a Jamesian sense—as soon as one passes a level of comprehension, of sensory co-ordination, the boundary condition defining chaos will apply, even though one can easily list all the components of the given state.

Patrick Gilmore's Band

The name of Pat Gilmore has been immortalized in the lead-up to the song "Seventy-Six Trombones." The following story is recounted in Josef Skvorecky's novel *Dvorak in Love* (Knopf, 1987). It is perhaps the greatest tall-tale ever concocted in the history of music…which I relish quoting in full given the nature of our experiment. The story is of the great Boston concert which the penultimate showman and musical entrepreneur Gilmore staged in an large outdoor stadium just after the Civil War. Here it is being recounted to Antonin Dvorak ("Borax") by his drinking buddy, a tuba player:

> [I] stared in amazement at a hundred brand-new anvils especially imported from England, at the ten cannon deployed around the stage and connected by electric wires to the conductor's podium which towered above the stadium like an enormous lighthouse. At the other side of the orchestra pit was a larger-than-life orchestrion painted in carnival colours. Instead of the seventy serfs who once pumped the bellows of the famous Winchester organ, there was a steam engine ready to impel a gale of hurricane force into pipes as thick as the smoke-stacks of a trans-Atlantic liner. …[I] sat in a single row with eighty-two other tuba players (and where that row ended a phalanx of eighty-six trombones began), and ..[I] looked around at the vanguard of three hundred and thirty strings and the formation of a hundred and nineteen woodwinds, all with sub-conductors in black dress coats—….and seventy-five drums and timpani. When I was waiting there with the tubas, each of them polished to parade standards, I tried to imagine the sound. …a thousand men parading into the colosseum to play before an audience of fity thousand. They marched around the field and with their instruments saluted President Grant, seated in the box of honour. Then they searched among the chairs, for the next half hour, until each musician had found his place. […] The wheels of the steam engine began to turn. At first only the enormous wheezing of the machine could be heard. … Then, from the two opposite gates, a throng of ten thousand singers, men and women, paraded into the stadium, led by the choirmaster Zerrahn wrapped in a silver cloak. Three hundred firemen, in brilliant white uniforms and armed with hammers, marched into position at the anvils, and fifty gunner manned the cannon. It took an hour for everyone to get into position and there was constant applause. At last the creator of this dream, Patrick Sarsfield Gilmore, dressed all in gold, came galloping in on a white horse. A one-man elevator raised him to the summit of the lighthouse, so high above the stadium that it seemed to touch the bright white clouds. Though reduced to the size of a pinhead, he had a baton with a crystal in the tip that reflected the rays of the sun. He surveyed the endless rows. The audience settled down, the applause died and the smoke from twenty thousand cigars rose to the clear sky. From his perch on high, Patrick Sarsfield Gilmore raised his flashing baton, brought it down abruptly and with his left hand pressed the first button. Smoke emerged from the barrel of the first cannon, followed a moment later by the boom of the explosion. But an instant before that he had seen the red-faced sub-conductors wave their batons, and the doll-like harpists had strummed the opening chord: as the puff of smoke appeared, the tubas began to play Yankee Doodle. The second cannon went off before we had finished the opening bar, while the cannoneers swarmed around the first one, a fellow with a cleaning rod went to work, and they rammed a new charge down the barrel. And behind us, a choir ten thousand voices strong---"Why, that must have been…" Borax (Dvorak) shook his head and did not finish his sentence. "It was awful, sir. Delicate ladies fainted…but people were jubilant. They'd never heard anything like it before---as a matter of fact, we couldn't hear very much of it ourselves. We were sitting in the eye of the hurricane. The only thing I remember clearly is the cannonade, and then those three hundred firemen in the Anvil Chorus of Il Trovatore, trying to strike the anvils in unison and not managing it. On the whole it was---well, a

sound,.. Ghastly. But there was something….majestic about it too. Something…..”Like America,” said Borax (Dvorak). “Such things could not be anywhere else!” [38]

Here is an example (fantastic or otherwise) of choreographed *organizational competence gone awry,* a grandiose conjecture whose objectives have been missed. The display, the exultant cheering crowd and the process leading up to expectations for "music" –a paradigm of harmony and rhythm— becomes cacophony of sound and conception. Perhaps it happened…but it takes a novelist to spin our imagination to this pitch –for indeed to picture it is an experiment in one's thoughts of what might constitute 'chaos'—the open air venue, its crowds, its cigars. We can feel ourselves in that hard stadium seating and we are there experiencing the main attraction itself.

Could we have asked for more? All that Gilmore seems to have forgotten were fireworks. In fact, the novelist's art has decided just how far to lay it on…the details of coordination could hardly have been more greatly emphasized, nor the elegant simplicity of the final let-down with the term "ghastly." And yet were a film editor to lay hold of it, the steam-engine or the cannon might have exploded—or the subtlety of humor would have been lost in some other way to end in the traditional Hollywood version of crowd chaos, where obligatory explosions, and a view down someone's screaming throat, and a cut to trampled children must accompany our visualization of what "chaos" means.

But let us take the story from another angle. It brings out a comparable relationship between <u>cacophany</u> and <u>harmony</u> to that of *chaos* to *order*.   Is this a valid comparison? Are dissonances considered from the standpoint of their component "harmonies?" And if so, how can this be applied to our conception of the 'order' to be extracted from 'chaotic disorder'?

From the perspective of control, if we had a recording of this overwhelming and ghastly sound-stream, today's sound technician would likely have little problem separating frequencies, and creating algorithms to further extract the various players in this wonderful bedlam, reconstructing the original menu that Gilmore conceived of when concocting this spectacle of all musical spectacles. For a sound technician, Gilmore's overly-coordinated conception is much easier to map than, for example, the map of seventy trumpet players simultaneously practising in the gym before their audition for the U.S.Marine Band. Perhaps the only assist we could give them is by adding one trumpet player at a time until there are ninety, with the assumption that there are probably no more than twenty standard audition pieces to choose from.

Common sense affirms that "chaos" describes the melee when someone yells "FIRE!" in a crowded theatre, or "SHOOTER" at the mall. The immediate picture is of a thousand independent instincts triggered into essentially random motions with accompanying shrieks, screams and barking of orders, changing into clustering and herd behaviors as a majority follows the very first person identifying an escape route. Within seconds the nature of the chaos changes. The chaotic scramble contracts. This majority is fighting each other for priority of passage. And of course this is the iconic version of panic depicted in the movies; but it is quite possible that in parts of the globe accustomed to terror attacks and/or earthquakes, enough experience exists to have developed appropriate anti-panic habits of response. Statistically there will always be someone in the group that has experienced the coordinated and co-operating behavior that can quickly marshall sane and efficient movements, thereby mitigating panic. Such habits are tools of order, the stewardesses of calm under life-threatening stress that induces secondary shocks, heart-attacks, coming-to-blows….the breakdown of independent but co-operating self-contained modules. The breakdown is iconic, and we all recognize and fear it, and so it is only natural that it's idealized in every film script.

Enter Entropy

At one time the "law of entropy*,"* also known as The 2nd Law of Thermodynamics, was considered in the popular mind as a tendency of all things physical to approach a maximum state of "disorder." It was also expanded to anything it might reasonably apply to, for once a nice principle is discovered it will tend to advance its way up our mental organization of things until it is clearly incompetent to do the work it was originally intended to do.

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[38] Ibid., p.47-48

The idea of entropy presents a very nice picture, especially since Hiroshima proved to the entire world and not just the engineers and physicists around Los Alamos that matter is just highly organized energy. The intelligentsia had known this truth for forty years but no one had ever witnessed it as a fact.

The 1st Law of Thermodynamics tells us that no matter or energy is ever lost to the universe—but now we found out that matter and people and highly organized cultures could be wiped from the face of the earth—or the universe as we knew it….leaving only energy in its rawest state. Now the 2nd Law of Thermodynamics had to be applied. Previously, when energy and matter were discrete realms of existance, an explosion of such magnitude would only have meant that energy had been applied to do plenty of work reorganizing n-numerable local molecules into different states, while the rest of the energy would dissipate across the planet as tremors and across the universe as light energy in photons. But no matter would have been destroyed. The only destruction would have been calculated in terms that Life Magazine later showed of the human and social devastation.

But the magnitude of this blast was not simply caused by the breaking of molecular bonds, but rather *atomic bonds,* the connections inherent in the realm of subatomic particles, which included those photons still travelling to the outer reaches of the universe. In any case, the mere idea of this *energy* being subject to an inhuman law of its own was still comforting, as we might explain that in a *theoretically closed container* nothing at all is lost of all this energy, it has merely changed its state…and described statistically over time, it would continue doing work of a molecular variety, progressively normalizing all matter –bringing it into a commonality of structures until no further work could be done. The eventual state of affairs would not have lost any energy, and the remaining matter would still be bouncing around with its electrons and subatomic particles constantly expressing that energy in the "effort" to see if any more work could be done. And pictured in this fantastic and over-simplified way, the 2nd Law (as commonly pictured since Lord Kelvin expressed it in its popular garb) leaves the end of the universe still in motion—with the god of energy never having died at all.

"Entropy," considered simply as "disorder" is so-pictured by a gaseous equilibrium where nothing further gets done, statistically, for the whole. And we've seen this is *not* what we'd picture as chaos, it is rather an equilibrium (as in our ecology) that is the quiet *outcome* of some maelstrom of chaotic disintegration. It is in the jostling and subsequent search and blowing up to find common denominators that the actual "chaos" takes place…but the term *chaos* is being applied to our inability to isolate all the causal features of what is going on in that explosion---why certain collections of things do one thing *here* while the same collection behaves differently over *there,* and why we can't predict all the interim phases of structure when the "explosion" of change is not immediate but stretched out over time. If we could isolate particular factors we could invent tools to potentially control them—and as we've already argued, this is putting chaos to work, in which case the term chaos doesn't particularly apply. We generally call this kind of chaos 'turbulence,' which is energy that can be put to work if we can channel it, but which is otherwise counter-productive. We study turbulence in order to harness it, and so in *this* sense it's quite valid to speak of harnessing chaos.

The revolution in scientific thought over the last decades of the 20th century might be summarized (but this is only one perspective) as the isolation of various factors contributing to turbulence—e.g. a turbulence approach to all chaos, which discovered a number of common features that could be described mathematically, i.e. with symbols and equations that could be mapped to the laws of numbers. This has been a major breakthrough. A word that was central to this breakthrough—which introduced the potential of bringing order to chaos through a theory of turbulence—is *entropy.* Having already discussed its role in giving us a 2nd Law of Thermodynamics, it was its later re-evaluation and detailed examination that provided a new approach to understanding the nature of *order* and *structure* as arising out of the "laws" inherent in turbulence, in this case understood as the deeper structure, or *meaning* of entropy. It is with "entropy" that the connection between complexity and chaos theory was born.

Norbert Wiener spent the entire introductory chapter of his popular magnum opus, *Cybernetics and Society*[39] to his explanation of entropy, and its role in the story of how statistics was first applied to Physics by Wilfred Gibbs.

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[39] republished in 1950 under the very prescient title, *The Human Use of Human Beings.*

Statistics is the science of distribution, and the distribution contemplated by these modern scientists was not concerned with large numbers of similar particles, but with the various positions and velocities from which a physical system might start…[…] They retained…the principle according to which certain systems may be distinguished from others by their total energy, but they rejected the supposition according to which systems with the same total energy may be clearly distinguished indefinitely and described forever by fixed causal laws."

"Gibb's intuition was that,…in general a physical system belonging to a class of physical systems, which continues to retain its identity as a class, eventually reproduces in almost all cases the distribution which it shows at any given time over the whole class of systems. In other words, under certain circumstances a system runs through all the distributions of position and momentum which are compatible with its energy, if it keeps running long enough.

"This last proposition, however, is neither true nor possible in anything but trivial systems. …"
(*Cybernetics*, pp.15-16)

It seems that Gibbs needed a way to apply statistics to *non-trivial* systems, to explain the origins of structures, instead of their dissolution—which the simplistic and un-subtle (e.g. non-natural) application of "the law of entropy" (the 2nd Law of Thermodynamics) implies. So Wiener tells the story of Borel and Lebesque's work with Fourier series in pure mathematics, and his own discovery of how this could be applied to his Gibb's work in physics.

Wiener attributes to Gibbs the greatest credit for the revolution in 20th century physics, "rather than Einstein or Heisenberg, or Planck."

"This revolution has had the effect that physics now no longer claims to deal with what will always happen [as in a pure Newtonian model, MY NOTE], but rather with what will happen with an overwhelming probability." (ibid., p.18)

He goes on to compare the idea of a "contingent universe" (the title of his introductory chapter) as parallel "to Freud's admission of a deep irrational component in human conduct and thought," [40]

But it is only then that Wiener concludes his definition of *entropy,* which he words fully consistent with James' pluriverse:

I repeat: Gibbs' innovation was to consider not one world, but all the worlds which are possible answers to a limited set of questions concerning our environment. His central notion concerned the extent to which answers that we may give to questions about one set of worlds are probably among a larger set of worlds. Beyond this, Gibbs had a theory that this probability tended naturally to increase as the universe grows older. The measure of this probability is called entropy, and the characteristic tendency of entropy is to increase.

"As entropy increases, the universe, and all closed systems in the universe, tend naturally to deteriorate and lose their distinctiveness, to move from the least to the most probably state, from a state of organization and differentiation to which distinctions and forms exist, to a state of chaos and sameness. In Gibbs' universe order is least probable, chaos most probable. But while the universe as a whole, if indeed there is a whole universe, tends to run down, there are local enclaves whose directions seems opposed to that of the universe at large and in which there is a limited and temporary tendency for organization to increase. Life finds its home in some of these enclaves. It is with this point of view at its core that the new science of Cybernetics began its development." (Ibid., pp.20-21).

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[40] He concludes this paragraph with "Yet in their recognition of a fundamental element of chance in the texture of the universe itself, these men are close to one another and close to the tradition of St. Augustine. For this random element, this organic incompleteness, is one which without too violent a figure of speech we may consider evil; the negative evil which St. Augustine characterizes as incompleteness, rather than the positive malicious evil of the Manichaeans."(Idem.)

While this does *not* contribute to the discussion we are in the midst of, I have included this in the context of Wiener's discussion of 'order' because we shall also have reason to turn to Augustine and his understanding of chaos in our next chapter.

In providing the extensive quotes from Wiener to qualify our notion of 'order' and 'disorder' from the standpoint of "the law of entropy" we are provided another perspective of analysis. The Cybernetics that he founded, in parallel to, and in conjunction with Shannon and Weaver's *Information* Science (or as it's comfortably known among computer bums as 'IS')—has actually introduced an entirely different paradigm to modern life (of the IS), one that has so far gone un-noticed but makes it possible to accept a pluralistic world-view that academics (as opposed to computer bums) have been intellectually fighting for nearly a century. The paradigm-shift I am referring to is that *computer programming* treats everything in the physical world from the standpoint of "state conditions," but in this way dispenses with the concept of fixed states and is based on a process paradigm of the universe, and around programming conventions.

The world we live in has been entirely refashioned by the work of our machines, which only have been made to work through the theoretical constructs of science—but these, in turn, have been discovered and fashioned in the way Wiener describes—that quite precisely map reality with enough imprecision to thus imitate it and become a substitute for reality.

The fact that the process model works, and has continued working for us, allows us to have faith in it—yet meanwhile holding quite tightly to a static model of *things that exist* as if they were not constantly in flux or potential flux. We continue to use our words as if they are holding us to a static model of things—what James calls the "Spinozoist block universe." With the advent of IT (information technology, which is the object version of the ontological assumptions underlying IS) having taken over the management of our world, including our personal worlds, a process view of things can prevail. Every child shall grow up with Heraclitus' vision of living in a river of change, where only the protocols for handling change are relatively fixed. The establishment of a process paradigm is, in fact, a *fait accompli* – though we still trudge along firmly in a single state world of linguistic concepts and their constraints.[41] But I am ahead of things.

We are after a way of speaking about multiple ordering principles, which might be a good way to discuss natural and complex "imponderable systems" such ecologies. Our concept is that of "ordering principles" *rather than of 'order' itself.* To consider 'principles' as nothing more than a metaphor for *order* may or may not be appropriate. Systems analysts are tempted to consider multiple orders as *competing with each other,* so that they can call in von Neuman's poker theory—but we must admit that in most cases they are not competing at all, for there may <u>or may not</u> be some standard for maximization taking place. Such a maximization standard is an economics. If we could know for certain what each ordering principle was trying to maximize (strategizing priorities for the short and long-term balances) all of it might eventually worked out…but in the case of an ecology, for example, such strategizing priorities lead to what? The ecology doesn't know beforehand. Yet the governing principle, if indeed we can call it that, must allow us to describe and maximize the chances of leveraging the whole for our own particular purposes—like a climber trying to gain the summit. We must assume one purpose. That is what all the representation and control is meant to achieve. Thus, we *assume* a basic ordering function—our "ordering principle." It is counter-intuitive to speak of multiple ordering principles for the climber who must reach the summit—but not for the ecology, whose end-state is emergent, whether or not it is less complex or more ordered. The chaos is in-between steady-states. For the extreme climber, the chaos is continuous with the climb itself, for the only true steady-states are at the ground and the summit. And we have no problem considering the climb as a process-modulated event state, a protocol of intuition +experience +guts +skill that the computer programmer is wise enough to stay away from trying to model. This is why extreme sports and incredibly artistic performance spaces such as Cirque de Soleil are gaining ground in our process paradigm world-view.

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[41] Alfred North Whitehead strove manfully to create a process model in his next-to-last book, *Process and Reality,* where he was forced to invent a whole dictionary of terminology to explain himself—which of course ends up explaining nothing until you adopt his viewpoint in order to begin to grasp his terms. Isabelle Stenger's even more massive *Thinking with Whitehead. A Free and Wild Creation of Concepts* (Harvard, 2011) can help you along in either English or French (it originally appeared as *Penser avec Whitehead: "Une libre et sauvage creation de concepts* (2002). Whitehead soon after relented, and wrote *Adventures in Ideas* before he died, which hides the process paradigm behind the problem that appears once the process paradigm is *fait accompli.* The *new problem that arises* is "what becomes of space when all *things* are dynamic? Whitehead ties it rather obliquely (through Plato) to similar problems in quantum physics.

We have the need and with the analogy of extreme sports the reins by which to harness chaos. The analogy is to James Radical Epistemology where you must leave rationality to the side in order to maximize percept and experiment space.

In a natural ecology, where the nutrients in the water that support several interactive species are supplied by a microorganism that feeds off the minerals in a vein of underlying rock, we have an example of *different orders of members of the 'system',* that we have chosen to investigate. These "orders" are not simply different species of plants or animals or inorganic chemistry. Each of them has their own unique "life" (existence) protocols, or program-sets constituting "principles of order," giving them abilities to sort and organize their world according to a unique structure and makeup, potentialities we might call instincts, or anthropomorphize as "personal gifts whose potential may be maximized."

The differences between the vein of rock, the microorganism, the nutrients cast off by the microorganism's metabolism, the various fish and plants that live off these nutrients… up the ecological tree, its roots and undergrown…are *not directly interacting.* There is no "conscious" seeking out and discovering the existential requirements of one order of life as relating to another… and by *conscious* I mean 'no direct' causal-response interaction by any member towards another[42]…dispensing with "consciousness" as James does, but still allowing for an active center of '*experiencing' action.* Inter-relations are essentially independent of one another, while dependent on being in proximity and within an overlapping time-frame. Relationships between orders are coupled with a cotter pin, loosely connected but easily unhitched.

Let us say a bird *is seeking* sap for nest-building that it cannot find, and so goes elsewhere to seek. The connection becomes more loosely toggled if the bird's instincts let it substitute tar for nest-building, for the tar fails as soon as the eggs are deposited, eliminating the next generation of that bird in the local setting.

Non-Commensurable but Toggled

The relationships between different orders of existence (such as the molecular structure of the rocks, the metabolism of the microorganism, the viscosity and tissue binding of the sap) may be covered by the term *commensurability.* In essence, two different *orders of existence* can never be mated or mapped to one another—they are by definition discrete. But as my title suggests, something may be non-commensurate, but "toggled," where the connection or 'equivalence' or "fittedness" between ordering principles is <u>potentially</u> there. It is the nature of liaisons that count when you are considering what binds one thing to another, and we might expect many classes of binding. Clearly this is critical, and of topical priority to any postulate of pluralism. We shall step into it with a sufficiently vague verb, 'to toggle.' I hope to step out of it with a sufficiently broad understanding of the term 'equivalence' that can cover any class of functional relation—that is, any relation in which a function or equation (such as a multiplier) or protocol can treat them at equity, or enough in balance with one another to be considered continuous.

I have used the term "toggled" here to point to a type of explicit connection that cannot directly specified…yet. The term *toggled* is generally used as in "toggled on and off," where the toggle-switch itself may catch and push a sprung flipper from one state to another. In my use of "toggle" the toggle-switch itself doesn't "know" or specify the state; it doesn't "care" if it is on or off, but simply that it is capable of flipping it. Most notably, this capability is ONLY dependent on a proximity to the flipper. Where there is a cotter pin (*also sometimes called a* "toggle") the relationship is fixed but easily broken. The structural change takes place when it becomes the hinge pin in a traditional door hinge—the pin is now the link between a mated pair, where open/closed is also not the issue, but continuity of swing. The spring that ensures on/off states may still be in place, as in certain spring doors…and similarly, the pin may be gone and the mated hinges will be held together by a variety of other forces—but once these are dislodged they are nearly impossible to re-set and pin. Thus, my enhanced definition of *toggled* connotes an implicit relationship based on certain shared, but gross, structures.

All of this is to allow us to explain that *to be unified may only mean to be toggled* in this sense. All mathematical statements are not *directly* mappable to one another—just as analog and digital, spatial and numeric, are not entirely continuous or *commensurate.* Someone who considers mathematics as the

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[42] Obviously, not always, for there can be symbioses (co-dependencies) that have become programmed by experience, and instinctual over time, so that members of two orders actively seek each other out.

paradigm and source of *all* logic, and thus as a proof that <u>all is unified</u> and all is potentially logically connected must also accept this belief in a logic that is Pluralistic in nature. For the practicing mathematician knows implicitly that their field is *toggled* and *not unified.* And for a non-working mathematician, if someone's faith in science and the scientific method of doing things ultimately rests on the firm foundation of mathematics, they must look to the deep philosophy oif mathematics and its various disciplines as a telling proof of the shape of nature and the constraints on absolute unity.

This is to say they must contemplate deeply on the toggled nature of "uni-versal law", and open themselves to a Jamesian methodology, which is essentially J.S.Mill's logical basis of empirical research. The scientific method hasn't changed a whit, simply the fallacy of absolutism that Comte fell into, a "superstition" (as James calls it) which the majority of modern academics still fall into despite Mill's having soundly debunked it.[43]

But the non-commensurable nature of mathematical realms is explicitly described by the physicist Richard Feynman, in *The Character of Physical Law.*[44] Feynman makes it pretty clear that there are discrete branches and types of mathematics and mathematical logic that do not map to one another, but that are connected through particular commonalities and attributes which physicists can pick and choose from, but which also keep the field of physics from having a central governing equation. Physicists, while they speak of such an "equation" generally mean an equation that will restore symmetry to all the known laws—*not an equation from which to generate all the known laws, and more.*

I am not sure if anyone has ever produced a layman's philosophy of this non-commensurability. It may be a parallel symptom for mathematicians of what Feynman describes as the most telling clue to the true state of physics is that there is (or was in 1965) no single agreed-upon way to speak of, energy. G. Polya, in his *Induction and Analogy in Mathematics* (Vol. 1 of Mathematics and Plausible Reasoning, 1954, Princeton.) constructs his two volumes around the problem of non-commensurability, and the ongoing quest of mathematics to discover more connections.

This is a world that generally only mathematicians are familiar with. For them it is the lay of the land, in which different *realms* of mathematics which are not necessarily *directly* mappable one to another---they are often discontinuous and without common denominators except what they share in a common method—which is digital in the relations of series and sets, or analog in handling topology, and a mix of both in geometry. One might compare the analogy to the difference between topographic maps and streetmaps, utility grid maps, demographic distribution maps, membership maps for newspapers churchs or athletic groups. They do not all fit together, though they are overlaid on the same physical coordinates—yet it can be argued that soil composition and geological maps of what lays beneath the surface of roads and sewer pipes and gas lines is of a different order altogether, as are meteorological projections showing predominant weather patterns due to topographical features.

So much for the term *maps.* Or is it?

Methods are held in place by mappable relationships to the world as we experience it, and so we know that somehow, eventually, there is a directly mappable relationship—some mathematician will "hook them up" with an equation. This equation is the juncture of previously toggled ordering principles— the sudden dis-solution of boundaries into a new solution, map, model, or paradigm that lets you find your way around.

That *equation* shows a path of *direct functions* linking the two previously incommensurable fields of study, which were the "ordering principles," where *principles* are the strategies or methods with intrinsic boundaries that were part of the map definitions. Those boundaries have been changed by the equation—a shared methodology represents a direct link to another field which is linked to several others.

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[43] In his book-length treatise, *Auguste Comte and Positivism* (1891) Mill explains the basis of Comte's self-proclaimed "Religion of Man." It is worth noting here.

"M. Comte believes in what is meant by the infinite nature of duty... He refers the obligations of duty and all sentiments of devotion to a concrete object, at once ideal and real; the Human Race, conceived as a continuous whole, including the past, the present, and the future. This great collective existence, this "Grand Etre," as he terms it, through the feelings it can excite are necessarily very different from those which direct themselves towards an ideally perfect Being. It has, as he forcibly urges, this advantage in respect to us, *that it really needs our services,* which Omnipotence cannot, in any genuine sense of the term, be supposed to do."

Comte's 'Religion of Man' unfortunately still seems to serve as the lowest common denominator for all the sciences. See the discussion below, p.42 "A Backstory to the Modern Scientific Method"

[44] 1965, MIT. Chap. 2 "The Relationship of Mathematics to Physics"

Returning to the map analogy, the utility grid has direct historical connections to the housing patterns distributed along roads that (again historically) were somewhat connected to the topography, which can now be directly correlated to topographical and ground-quality features that influenced the original construction of both roads and utilities.

And so in the same way, we can arrive at the intuition of the final unification of all realms of things as being representable (e.g. *functionally equivalent)* by mathematics. Notice that the intuition merely points to mathematics *as a methodology,* and we assume (incorrectly it turns out) that the methodology is one continuous whole, e.g. unified. The methodology is itself the underlying law of mathematical principles as constituting a way of going about the work of mathematics…not the number theory or the amazing properties one discovers of circles and distances and their emergent relationships which are the substance of each type of math. Indeed these are 'fixed' but yield new fixednesses with every new relationship and perspective. For now, we can conceive the terms *law* and *principle* and *methodology* as tied together… the lawgiver is a no more than a King Solomon or King Minos attempting to balance unique circumstances in the chaos of life to something that *may be* fixed, e.g. *ordered*.

James' final criteria for all science in his description of Radical Empiricism is through connection back to relations in the actual world —everything, otherwise loosely coupled through existence, will be toggled more or less directly, and potentially *equated* through one or more related methodologies. *But the belief in a single* "equation" is merely a belief—the ultimate rational fantasy that is the demon behind vicious intellectualism. This is the craving for unity that both James and J.S.Mill were especially vehement over. The backstory to Mill's own vehemence becomes immediately pertiment to James' battles with the academics of his time over unifying theory….arguments which lay the groundwork for firming up our hold on 'Chaos, Law, and Order' from this newly workable perspective.

§

A Backstory to the Modern Scientific Method

There is an interesting history to John Stuart Mill's break with the belief in the dominance of a unified theory, or the attempt to discovere such a theory, as the goal of science.

Mill's discovery of vicious intellectualism (though he didn't call it that) was in the politics of his time. His father, James Mill was among the leaders of a movement of eminent scientists, who, in a flowering of Enlightenment ideals at the turn of the previous century had decided it was time for the forces of Reason to take control of Parliament. This was the early 1800's, at the very time Hegel was the talk of Continental Europe. They were the leading stars of the English intelligentsia, and included such eminences as David Ricardo and Jeremy Bentham. They formed a new party to take on both the Tories and Whigs of their time, calling their party the Radicals, aiming to rule England with the logic of Utilitarianism (using Bentham's Pain/Pleasure Calculus) and Ricardo's amplification of Adam Smith's recently published principles of economics. John Stuart , the son of James Mill, had been raised by his father in the dream that John would write the crowning unification of their systems, and to perfect their postulates into applications for the perfect social system. Instead, the young prodigy became a prodigal—he was influenced by Comte's Positivism, and 'perfected' the English Rationalist movement by blowing it up with his *Logic*….and in doing so he perfected a Positivist *method,* which he bequeathed to modern science. Paralleling and tightly qualifying Francis Bacon's insistence on the priority of experimental results (before religious causation)—Mill showed that logic is not the basis for truth but for interpretation and the generation of hypotheses to direct further experiment (and learning by actual experience).

Science's *task* would seem to be the application of logic, not the generation and promulgation of truths. Truths emerge *of themselves.* The argument is subtle and ongoing. Mill's approach can be associated with a natural skepticism and a faith that one establishes the realities in bits and pieces and the truths will only emerge as new explanatory theory—not Truth of Itself. Reality is natural and smudged— laws interact with other laws by chance and imperfectly and shall always take new sorting out.

But there is a reductionist argument to this –a belief in the "hidden hand" of Laissez-Faire. And in its own subtlety there is also a hidden recursive loop… that of a responsibility to help the hand. Comte's turned Positivism into a social strategy of scientific triage called "The Religion of Man." This was, of course, inimicable to John Stuart, whose refutation came at the same time Marx and Engels were trying to ressurrect his father's political ambitions for a rational utilitarian society.

What James calls 'vicious intellectualism' is the hubris of imposing an *intellectual* structure—casting off the natural structure as irrelevant wherever it appears imperfect and smudged—when it doesn't suit the present purposes. Vicious intellectualism is like the fabled Greek highwayman Procrustus. Radical Empiricism is an attempt to qualify Mill's methodology by insisting that we *need* a bed, which is the human condition, but the bed must be and is always adjustable.[45]

From this high talk of the objectives of science, let's drop back to a more topical subject, that of *connections* between discrete things within multiple realms of activity governed by different ordering principles. This is both necessary for Pluralism and central to our theory that 'Chaos' is essentially our natural response to sensing a pluralist reality.

§

Commensurate as Marriageable

Let us posit, for the time being, that to be *commensurate* is merely to be marriageable. This does not mean entirely unified, nor necessarily completely in harmony. In strictly human *social* terms to be 'marriagable' is trivial from the physical standpoint of copulation (that is, physical commensurability) but takes on its complexity from a psychological and social and contractual perspective—generally in that order, but reversed.

The analogy to *marriage* is not meant to be tongue-in-cheek. As C.S. Lewis reminds us in *The Four Loves*[46] there are the bonds of affection, the bonds of friendship, the bonds of eros, and the bonds of charity—as well as the bonds of pure fantasy (which he includes under 'Venus', with Eros) that may have incredibly stronger effects than all of the others combined. Most notably in Lewis' treatment of the four classical Greek terms for "love," each is described as having specifically functional and *dysfunctional* properties concerning the social and psychological bonds that are created. An analogy to *marriage* provides a strong case in our analysis of commensurability.

How many types of bonds define a marriage, and by whose criteria? How are the functions and ends of *marriage* commensurate (matched, mated, parallel, equivalent, toggled) with those of *commensurability*…and need we even consider *'function'* as having anything to do with what it means to be 'commensurate'?

You may remember that we began this chapter with a potentially problematic definition of 'chaos' that supports—in fact directly points to—a Jamesian *multiverse*, or pluralistic universe. I defined *chaos* as merely, "a situation in which multiple sets of ordering principles are simultaneously at work."

 Our talk of commensurability is about *multiple sets* of things being *simultaneously at work*. This is a nice way to consider both marriage and commensurability, as well as a prevalence of chaotic marriages. We find most marriages toggled in various fashions…and yet James would argue that Pluralism insists on the world of experience that holds itself together in just such a way.

An insistance that *being requires a single principle behind it,* e.g. a uni-verse, we must base the entire argument on this discussion of unification principles. What it means to be "connected" or "related," and ultimately "on equal footing," or "of the same order." The problem underlying Pluralism is one of

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[45] The importance of this backstory is that it represents a continuing paradox in the funding of science. For Mill's Logic has a hidden and equally vicious defect if it is not further qualified by James' adjusted methodology for research. The hidden defect is the supposed 'disinterested impartiality' of science, where the quest for nature's truths must overshadow any consequences. This supposed 'impartiality' turns partial and hypocritical through personalities and their motives, and providing grist for the literary mill of science fiction—from H.G.Wells'optimism to the cynicism of Kurt Vonnegut (I mention these two because I have recently read Wells' odd Food of the Gods and Kurt Vonnegut's Player Piano which both play on this hackneyed but quite current theme.) and many others who consider the impacts of unimpeded scientific curiosity masquerading as wisdom.

    The scientist is often pictured as the naïve and truculant child, with 'scientific curiosity' considered natural and self-satisfying, but no less than defecation.

    Ernst Cassirer advances a forceful argument against Mill's "detached and piecemeal" approach in *The Problem of Knowledge. Philosophy, Science, and History since Hegel* (Yale, 1950), stressing the importance of Comte's entirely humanity-focussed end-goals for science, where the final arbiter of truth is the sustainability of human society. That this is aligned with James' qualified empiricism becomes evident in James' Existentialism, which we will find rests on the phrase "that great continua of time, space, and self."[45] Radical Empiricism implies a continual experiential (and necessarily solipsistic) check with the present—a solipsism that is essentially timeless, a connection to Comte's 'Le Grand Etre' as if perceived through the lens of Sartre's *'L'Etre et le Neant' (Being and Nothingness).*

    [46] 1960, Harcourt Brace Jovanovich..

connections between the multiple orders that are "non-commensurate but toggled," just as any arguments *against* Pluralism must provide an explanation of commensurability and the ultimate criterion of connecting anything and everything to each other. This is where mathematics is trotted out in its Superman costume.

⇑

We needn't solve the problem between Pluralism and Monism. We need only recognize that it is still a problem, that there *IS such an argument,* and that taking a Pluralist vs. Monist stance has never really been "settled" in the scholarly mind, It is basic to the problem of knowledge, not only to the purposes of science but to education itself. It is the substance of the question itself that is relevant to how one teaches anyone the options for interpreting life on Life's terms.

4. The Failure of Pluralism

The ideals of unified science, and the continued fate of James' extreme pluralism are considered in light of modern theories of systems, ecological fitness and complexity theory. Why James' extreme pluralism cannot be applied.

The problem of Pluralism in which *different laws of order may apply* simultaneously…in fact, *must apply*…has major impacts on epistemology and the constraints of our knowledge. For anyone who believes in a *Universe* that is by nature absolute, Pluralism will always seem to open the floodgates of logical chaos.

Einstein eventually became a thorn in the side of modern physics because he refused to accept the underlying thesis of quantum mechanics—which is the most outright demonstration of the chaos engendered by pluralistic logic. In quantum mechanics, the familiar laws of the universe as we experience them in the 'larger real world' no longer apply. Most simply put, you can shoot a photon through one hole and measure it coming out two. Space and time get subtly separated, energy and its alternate phase as matter behave like *things* and like *waves* simultaneously and bring about different results in your experiment depending on how you look at them. Einstein apparently stayed a "unitarian" until the end of his life—even though ironically his *Relativity* was what opened the way for sub-atomic theory and experiments that made quantum mechanics possible.

It would seem in retrospect that James missed his big opportunity to propound Pluralism; had he lived into the age of quantum mechanics he might have pointed to the experimental proof. What is perplexing is that he would not have convinced Einstein. What I find even more perplexing, however, is that the phalanx of modern physics never embraced Pluralism, or grabbed onto James as a supporting philosophy.

The problem is that James' Pluralism is an *ontology,* a philosophy of the basic nature of being. Modern science—whether that of Einstein or the all-pervasive reaches of quantum mechanics that dominated the 20th century scientific paradigm—maintained an ontology in which a single source of law underlay a single universal whole. I shall not attempt to expand on this paragraph, for I introduced it as my conclusion for a most perplexing problem in the history of philosophy of science. Rather, I will return to the argument of James' Pluralism as we've developed it thus far.

By his logic, let us project n-numerable ordering principles governing "the whole," which is now defined as a *multiverse* or *pluriverse.* If we extrapolated this to the entire *all* of the universe, allowing a toggled set of ordering principles, even just two, logical chaos would result—there is no reason for anything to hold together, while experience proves that it does. We needn't assume maximum disorder ensues wherever ordering principles coincide, overlapping in proximity and time—for they may well be toggled in some way, co-operating things. It is only when they are impeded from co-operating that *some form* of chaos (in this case, unpredictable process) results. We might picture this as the pin connecting two principles *potentially* in place to bring about a marriage of two discrete orders, but there's no connection yet…the joint is still free, the door is hanging and swinging, but grasping the knob a different way and applying a new effort of opening the door and walking through, instead of swinging open the whole door simply tips off.

This does *not prove that it must be unified in any fully connected sense*…simply that "unified" or "One" has many possible colors while satisfying the requirement of "unified" and "One."

Now clearly if the possibility exists for more than one governing set of "fundemental laws," it is not illogical to suggest n-sets of laws or ordering principles, and switching over to the metaphor I alluded to as "colors" of One, let me repeat the previous argument for Pluralism.

> "Now clearly, if the possibility exists for more than one color of 'fundamental law,' it is not illogical to suggest n-sets of such laws each requiring its own polarizing filter."[47]

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[47] This restatement is simply intended as a verbal sketch (or a 'croquie'); the argument for Pluralism doesn't rest on it, though I am afraid a semantic disquisition of light frequencies can, and will be used to "prove" the contrary. However, before taking apart the filter metaphor, please turn to the chapters in Part 2 (7. Perspectives on the Expansion of a Point and 8. Entailment) in which I develop a concept of 'punctuation' that does what I allude to with 'filters' here.

If we were to define chaos as a problem of disorder derived from overlapping governing principles—unless some rule exists to handle conflicts, e.g. an overall *governing set* of protocols exists—we must accept that all exists in chaos. The idea is that in a pluriverse there can be no such unifying "governing set," at least for very long.[48]

We have already considered the case of the computer programs, but understand that programs are designed for closed universes—just as Wiener minced his words describing entropy as only applying to multiple mutually-nested closed systems. If the boundaries are broken, and a foreign code gets swapped into the mix (as hackers specialize in doing for us), the application goes berzerk or simply shuts down (or provides someone *outside* with a flow of information to assist in the creation of a social or banking chaos from which byproduct benefits may be reaped).

But this *is* exactly how a *pluriverse* would seem to operate, in which case the matter of chaos *should be* a highly practical business—for chaos will merely be another expression of pluralism, where the number of discrete, but toggled, ordering principles at work simultaneously and coincidentally might serve as a measure of chaos within a given set of boundaries.

Unfortunately, we don't seem to differentiate chaos in *kinds* and *classes,* since that would be to attribute to it some sense of order. But we have already acknowledged this as an argument that any refutation rests on, that a *sense of order* is "officially" not allowed by the rules of logical contradiction.

My guess is that this simple contradiction is why Pluralism never caught on. Semantic reductionism. An over-reliance on our supposed understanding of the term 'order' as essentially defined by its opposition to 'chaos,' where 'chaos' (as intimated in the Random House definition) still held onto its old obsolete meaning of ABYSS, CHASM, e.g. infinite nothingness, vacuum, or total negation.

As I claimed in my *Introduction,* we are still guided by James' own childhood superstition that there will be a great unification *principle,* instead of a unifying *approach* or *method.* And while we stand stolidly behind J.S.Mill's scientific method, supposedly open to any repeatable results, we are guided by the superstition, to confirm the Rational Idealism of the early 20th century who were the unwitting children of 19th century "Monism."[49]

James had intuited, and consistently "proven" what 20th century physics would counter-intuitively and continually reaffirm, that a certain amount of fudging *seems to be the law*. A "Universe" as such—connected and generated out of a single grand principle—would always be smudged. A "pluriverse," on the other hand, needn't be *considered* smudged…it would always return us to the objects of pure experience rather than logical ideals whose only reason for being was clarity and perfection. The problem being that logical ideals couldn't, by definition, be smudged—and while James agreed with this; ideals were allowably *ideals* but not allowed to truly represent reality.

Another Backstory – Spinoza on Maimonides

James fingers Spinoza as the founding father of Rationalist Idealism. Apparently (and I have gathered this elsewhere) Spinozoism was not spoken openly by anyone during the 18th and 19th century but was read by everyone who professed to be an intellectual. I will suggest calling it "an underground cult" which allowed you to speak fervently and unhypocritically of "God's presence" and "God's will" while considering oneself an atheist, functioning as a kind of Marano underground for Enlightenment intellectuals in a very conservative and hotly contested religious culture.

For those unaware of Spinoza's thought, I provide an exceedingly short 'brief' in my own wording. This is not a place for a disquisition on Spinoza. The point at issue here is not what Spinoza *actually said*, but *how intellectuals seemed to interpret him,* for which the following reductionist summary of my own provides an excellent, if limited, example:

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[48] A meeting –perhaps of the school board—in which each of the participants was speaking from the perspective of one of James' seven "realities" might truly move itself glibly along, for there is a unifying purpose or principle "moving it along." The definition that provided for proximity and temporal coincidence is the functional *de facto* unity. *De facto* coincidence will become the focus of my "Logic of Simultaneity," for which all of this is the intended background.

[49] The premise of Stuart Kauffman's recent book on Complexity theory, *Reinventing the Sacred* (Pantheon, 2008) is to overthrow what he calls "Galileon Reductionism" which is his version of what James calls 'his youthful superstition.' I shall try to show below (The Failure of Evolutionism.p. 52) that James' argument against that superstition goes a step further than Kaufman's, which is still held back by intellectual habits, dreaming of Unitarianism. My own Pacioli Principle is likewise driven by that same premise, but includes, I hope, an appropriate escape to independence through its loop back through the ideosyncratic.

All is God. Time is an artifact of the linear stringing out of the All of God, for our limited ability to cognize it. Given God's interpretation of his creation we have free choice. For though quite beyond comprehension, by trying to understand God we participate in the perfection of the All.[50]

Circumventing time, he has created a block universe called 'God.' The Spinozoist conception is of a "soul" or "spirit" of the universe. The mind/body problem can be conveniently addressed but not solved for us, only for the All. One can be a materialist, either denying or accepting a creator (adjusting one's ethics accordingly) but still hold to some absolute eminence and ideal beyond human knowledge.

This was the intellectual context James grew up in, the philosophical environment of German Idealism, to which the Utilitarians and Comtian Positivists (along with American Transcendentalism) eventually succumbed. And what is the most perplexing twist of all, which James points out, is that traditional Western religion is quintissentially Pluralist, for the belief in God entails a faith that if God makes the laws, he himself is subject to none, or to a separate governing principle. Scientific "Monism" of the Spinozoist kind refuses this dichotomy—God and God's creation ARE NECESSARILY ONE. [51]

Immediately after Spinoza's works were published in the 1670's, to be labeled a Spinozoist was like an accusation of being a "red" communist sympathizer during the Cold War era. His *Ethics are* indeed an ethics, written as a counterfoil to what he considered the more dangerous materialism of Descartes' and Hobbes' works. Yet while the logical, idealist 'eternal unified block universe' he proposed to the Enlightenment was the living God himself, Spinoza was reviled throughout Europe and formally excommunicated by his Jewish brethren.

What is doubly ironic is a deeply Jewish context to Spinoza's thought. His logic may be called an extended formalization of Maimonides' own monotheism regarding the Credo of Judaism ("The Lord is One") which must be understood as a *unity* that is near incomprehensible and awesome in scale and yet must be faced personally by every ordinary individual. How much easier, Maimonides reasoned in his Mishnaic commentary, to have an intermediary in Pharaoh (an analogy he used in his debates with Christianity).

Maimonides grew up in Moorish Spain and served as court physician to the Califf of Egypt. He was reviled by the European rabbinic community for introducing Aristotelianism (drawn from Arabic sources) into Talmudic commentary. —The "Talmud" represents interpretation of *ambiguities in the law,* which as everyone knows was laid-down by God verbatim in the Bible, but couldn't apply to everything altogether on a day-to-day basis. Judges (such as Solomon) and wise men were still needed, and this is the reason for the Talmud, which describes the precedents set by various rabbis over history to handle non-conformances and special cases in the law.

Maimonides took it upon himself to interpret the Bible with logical methods borrowed from the ancient Greeks. His books were burnt by his own people (what would become the Ashkenazim of northern Europe); so to say you were a follower of Maimonides in Northern Europe made you suspect of heresy.

In the Islamic realms, however, Maimonides often represented Jewry at religious debates organized by his boss and chief patient, the Califf of Egypt, between Judaism, Islam, and Christianity. He clearly created an argument that respected, but trivialized Christian claims of the Trinity as being a special instance of "One-ness," while he challenged every Jew with the paradox of One vs. Many –that the daily recitation of the credo "Hear, O Israel, the Lord our God, the Lord is One" meant accepting all of creation as an instance of God's "One-ness:" every grain of sand, every star and every snowflake—all the distinct manifestations of existence were "one in God" and all of experience was lived in and through this "Unity."

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[50] I wrote this as my own 'take' after several years of not rereading this author…implying some horrendous liberties in paraphrasing. I stand convicted of the crimes I am trying to describe. Several years ago, when I *was* reading Spinoza, I was anxious to become a Spinozoist, reading and hi-liting and dogearring *On the Improvement of the Understanding,* and *The Ethics* (Dover reprint)*,* Stuart Hampshire's *Spinoza* (1951, Penguin), Arnold Zweig's *The Living Thoughts of Spinoza* (1939, Longmans Green), *Behind the Geometrical Method. A Reading of Spinoza's Ethics* by Edwin Curley (1988 Princeton), and Joseph Ratner's lengthy introductory commentary in *The Philosophy of Spinoza* (1927, Modern Library). I am hardly a Spinoza scholar, yet the above reductionist summary *was not taken from the secondary literature, but directly from Benedict Baruch's own words* and most likely indecently transmogrified by time and habit by my own mind alone.

[51] Simple people will often tell me "even Einstein believed in God!" Einstein openly used that term, admitting that if that God existed (In a way that should suit simple people) his God was Spinoza's.

The Jew's ethical conundrum was to find his own place and relationship to this awesome and awful immensity, while at the same time being part of God, himself.

Spinoza simply took Maimonides' arguments to their logical conclusion to include "all time," constructing an eternal essence from which all of our individual experience was drawn (I conceived it rather like a twisted thread from a skein of raw wool). Unfortunately this created the "block universe" and Spinoza had to show how ethical choices still existed and provided life's meaning to the individual.

Spinoza, like Maimonides, was a dangerous heretic because you shouldn't need to prove God's laws as logical before following them. The religious person maintained a pluralist backbone—that God's law for man's world *was born of a separate perspective and reality,* which man had no business thinking must be comprehensible to any logic of ours.[52]

Augustine's Heavenly Chaos

I imagine being in Harvard Square several decades back. We have just left the pipe shop and are leafing through a rack of books in front of a store when Dr. James walks out. We are surprised, but nevertheless jump at the chance to take advantage of this odd but adventiteous time-warp to ask Professor James the question that has been bubbling in our gut for some time:

"How, Dr. James, can my reality distinguish its "pure experience" from all the "pure experiencing" going on around it?

I will allow that my thoughts and my body be of the same primal matter *in the same space – separate and distinct in their own way—and I assume that they are both* pure experiencing *what you've called the 'perceptual flux', which has something to do with where you and I are now standing (including the time-warp that brought us together). But what and how is the* perceptual flux *different from the* pure experiencing *that is the basis of all stuff?"*

I can imagine the professor brightening up at this question, and putting his forefinger in the air, with "Let me show you something!" striding back into the Mediaeval section of the store as he deftly pulls a thin Penguin edition of Augustine's *Confessions* from the shelf.

"My brother Henry and I argued a whole summer over this when I was about twelve. Henry was ten or eleven. Naturally, he ended up the writer of novels while I became doctor of philosophy!" Winking, he goes on, "You know that pronouncement of mine that bothered you, that things and thoughts are the same 'materia prima' of existence? He's gotten to it here."

He opens up to Book XII.

"He is beseeching the Lord to explain what chaos he formed heaven and earth from, and how, indeed, it might have pre-existed a material world. His problem is *who* created *it!?"*

At that, James vanishes and we know it was not a time-warp but a dream concocted to create a good segue. We know that James was intimately familiar with Augustine's *Confessions* from *Varieties of Religious Experience,* where it is used as the prime example for his chapter on the divided self, so our segue is not entirely out of hand, only James is never so explicit. In our case, we need only show that this way of thinking about 'chaos' is not new, but well entrenched in the literature of the well-educated of previous centuries.

Sitting down a few hours with Augustine's book, it turns out that the newly-contrite convert, having finally given up the Manichaeist heresy (in Book IX) has just spent several reams of the previous manuscript (Book XI) on the analysis of time, the continuity of thought, and how there is no way to discern the beginning and end of a momentary conception. He points out that such flashes of insight come in clumps of associations *that appear in the guise of a linear thought, conceived of as spoken in a phrase*…all of this making no logical sense in the distinctions just made concerning the immediate past, present, and future. It is here that Augustine deals with the blooming buzzing confusion that the sensory system must sort out into the linear stream, as well as the problem of what that linear stream must entail in time. All this is in Book XI, which is the premise behind Book XII, *that the creation revealed (through Moses in the Bible) is still going on as we speak.* So in Book XII when Augustine concludes that the chaos from which God is creating the world is God's dwelling place, it is not the analogy created by some

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[52] That backbone is 'faith,' which is sometimes contiguous with the 'Holy Spirit'

superstitious dark age dummy… it is a terminological metaphor (you *could* call it a "placeholder") for something Augustine has no other words to describe. Chaos no longer has to *precede* the Creation in time, for he's dispensed with that problem in Book XI. This means that the chaos is either God himself—which cannot be—or is what is 'all around God,' or, as Augustine concludes, just another name for his "dwelling place," which is commonly called "heaven." So Augustine feels that the Bible (which through faith he accepts was given to Moses to write, but not necessarily fully understand the writing) says to us that "chaos" is actually something else than we are led to believe (or even what Moses might have believed), but that it is another name for "heaven" that both "cleaves to God" and (and this is the key to that 'space' that James is pointing to) *has within it all form and all the potentials of creation already wrapped up.* This is truly a "chaos" from our simple human perspective, but a highly ordered one.   The ordering principle that Augustine supposes, with a term he is reticent to use, is "intelligence." Chaos, or heaven, is intelligent in some way we cannot fathom, for the word used in the context of human intelligence is clearly misleading…but Augustine apologises for having no other word to cover what he is after.

   This strange idea of Augustine's has pre-empted James' allowing *things* to partake of "pure experience." He has suddenly redefined "chaos" as "heaven" and the dwelling place of God. All its potentials can be considered an "at-readiness" for God's hand to *put into motion,* which is the Creation…taking place as we are reading and thinking. All of creation partakes of the same *coming into being.* Our feelings of 'intelligence' are nothing more than participating in this process. It is simply our means of experiencing the universe, and our "pure experience" is no different than the bee who has just discovered sugar on the rim of my coffee cup. In a different sense of "participating in intelligence" it is the "pure experience" of the *active* forces defining my coffee cup in all its different aspects, and the sugar on its rim.[53]

   Augustine's final chapter (Book XIII) concludes with his methodology of knowledge, e.g. an epistemology of traditional faith. But once you consider the fact that the *Confessions* were a standard prescribed reading, at least by educated tutors of the wealthy for all boys entering puberty, it is only natural that William and Henry James discovered the exciting logical flip of Augustine's in Books XI and XII, arguing it out to their mutual satisfaction.

   Augustine's conclusions are quite useful in picturing the 'materia prima' that James conceives us experiencing in our own temporal slices of it…that is, through our "pure experience" of other modes of "pure experience." But James is less explicit than Augustine, and so for the time being, I shall refer to the 'metaphysical space' in which James would have us carry out our work (disambiguating the blooming and buzzing confusion that we experience in physical space) as "St. Augustine's Plenum." For that old North African rationalist insisted in a top-down world, as his faith told him it must be—but he insisted on critiquing it from an empirical bottoms-up position of the finite (e.g. fallen) human. And I suspect James falls somewhat into this tradition.[54]

   For the answer to the question I posed to the professor in Harvard Square (in that little time-warp), as to how he suggests distinctions are drawn between systems and modes of "pure experience," we must

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[53] I have assumed the reader is used to this level of abstraction, for it is what philosophers, especially those concerned with the immanent forces of nature talk about. In Augustine's time such considerations were fairly regular students' play. Random opening *The City of God* (written after the *Confessions*), I came on his discussion of Varro's theory of the individual soul as being an immanent *instance* of the world soul, comprised in parallel and carrying out, in miniature for each of us, the same ongoing struggle between three composite forces. (Book VII Chap. 23). The next opening (perusal at random) came on a detailed exposition and analysis of Plato's ideology that compares rather nicely to Alfred North Whitehead's.

[54] Alfred North Whitehead takes issue somewhat with James on this point in *Adventures of Ideas* (1933. Macmillan). The specific point is in regards to the "seat of consciousness," but what makes Whitehead's comments relevant to us is that they concern the metaphysical pseudo-spatial nature of the plenum itself, which the later author identifies with Plato's *recepticle.* Whitehead draws the connection between Plato and physics to a discovery announced in his student days, of Poynting's *flux* which, based on the work of Clerk-Maxwell, held together, locally, the principle of conservation of energy. Plato apparently realized the need for a concept to unite the various levels and differences that remained unresolved within his philosophy, and he proposes this complex idea functioning as kind of "world soul." Whitehead's quibble with James (his immediate predecessor in the chair of Philosophy at Harvard) is that James opts for a more accidental "seat" of that feeling of unification we call *consciousness.* Whitehead doesn't seem to realize that James' approach is in fact *more* in line with Poynting's flux, for it describes the necessarily *local* nature of a field preserving the principle of conservation of energy. Whitehead prefers a monist position….imputing to Plato that the plenum must be global—an "eternal everywhere." Our own perspective is to further qualify the *concepts* of 'local' and 'global,' to show that these are not state definitions but process definitions. Augustine similarly side-steps the problem by letting God do the local work—he follows his own laws and knot ours (i.e. *knotting* ours). I have nothing to say about the serendipity in the name of the physicist responsible for field theory. It is all an artifact of the English language, so unless we assume that God speaks English instead of Hungarian as previously assumed, the pun that fields might only exist through Poynting at them is merely a coincidental homonym.

defer a clear resolution. Augustine says he is after this problem as well—it is just that he leaves it to the marvels of the ongoing Creator's creation, for which he must constantly pray for clarification. The resolution of ambiguity is ever the problem of philosophers—we shall see it, ironically, as the core of James' philosophy. It animates an understanding of his notion of *pure experience.* It is central to our concept of a "*condition* of chaos" and our experience of the primary process, that of disambiguation.[55]

James rejected consciousness as a practical boundary, preferring to leave the practical boundary with the material, mechanical system (e.g. breath as the original source of "spiritus"). But we must also attempt to move on beyond James. For he considered his proposition of Radical Empiricism as representing a beginning, and never got to take up the majority of questions he proposed his methodology should attack. We are well within bounds to attempt some next steps, and need no longer quibble over fights between stodgy philosophy departments. To continue in that context would be puerile…and 'making it our own.'

There is therefore no need to continue the distinction between the rationalist (idealist) and empiricist (or radical empiricist) approach that James spent such energies on. Neither must we become overly worried over working in 'blackboard reality.' James does provide a long argument, several times over, for the valid work of induction, or what we may call "blackboard analysis." Hypotheses may well be floated, functioning as 'interim levels' of possible knowledge…obviously, subject to test, but his support for logical induction is circuitous and not easily quoted here, coming as it does in the midst of an attack on those who misuse it.

Augustine has changed the name of the game of understanding "chaos" to that of understanding the complexity of creation—why and how things are differentiated in such an incomprehensibly fabulous way to work as they do… an almost intelligent process that depends on….what? itself? But it is no longer "chaos" as we thought we knew it, it is suddenly friendly and strange.

Today's Word on Chaos: Complexity

The Arrival of Complexity Research

On the first page of a large and expensive standard college textbook, the 4th edition of *Molecular Biology of the Cell*[56] one finds:

> " 'There is a paradox in the growth of scientific knowledge. As information accumulates in ever more intimidating quantities, disconnected facts and impenetrable mysteries give way to rational explanations, and simplicity emerges from chaos.*'*

> "Thus began the preface of our first edition, written 18 years ago. Much of what we wrote in that preface holds for the present edition too. Our goals have not changed: we want to make cell biology comprehensible. We aim, as before, to give readers a perspective both on what is known, and on what is unknown.

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[55] I am reminded of the very first of the morning blessings that an Orthodox Jew will say. It speaks *recursively to the problem of ambiguity and disambiguation:*

Blessed are You [Lord] our God, King of the Universe, Who gives the rooster understanding to distinguish day and night.

This is traditionally interpreted as referring to the ability to tell good from evil, for in Hebrew the word "rooster" is a homonym with the word for "heart". But beyond the pun, it is really *a joke in the form of a prayer!* —for the rooster begins crowing with the dew, just prior to the dawn, and *doesn't stop* crowing until well into daylight! As many a city person angrily realizes on their first visit to the country for some quiet and peace, the Jew sees God playing such jokes on us, and must be reminded that disambiguation, i.e. *interpretation,* lies at the beginning of life, *just* as it is placed as the introduction to a long and involved protocol of prayer. Indeed, the prayer prior to that of disambiguation reminds one that known structure must be given priority and due respects—for the only prayers which precede that of our blessing concerning the rooster are the washing of the hands and the prayer to be said on the first morning's defecation, reminding us that if any of the orifices in the body were obstructed the body would soon die. The implication in the relative placement of these two prayers, is that a clearcut reference to discrete structures in the matter of life and death is immediately followed by the next job of practical experience: separating what is otherwise continuous: what we conceive of as discrete (day and night, good and evil) are separated by a continuity that requires interpretation for *proper* discernment.

[56] Alberts, Johnson, Lewis, Raff, Roberts, and Walter. 2002, Garland Science.

(…) As our book makes clear, the complete sequencing of the genomes of hundreds of organisms from bacteria to humans has revolutionized our understanding of living things and the relationships between them. At last we can see what is there: the set of genes and proteins is finite, and we can list them. But we also recognize that these components are combined for use in marvelously subtle and complex ways, even in the simplest of organisms. (…)Thus we are no longer as confident as we were 18 years ago that simplicity will eventually emerge from the complexity. The extreme sophistication of cellular mechanisms will challenge cell biologists throughout the new century, which is very good news for the many young scientists who will succeed us."[57]

The opening to this preface of *Molecular Biology of the Cell* is a wonderful terse statement of the premises of science itself—that, "impenetrable mysteries give way to rational explanations, and simplicity emerges from chaos." This was spoken in the shadow of Spinoza, still in the 20th century. But as of the year 2002, the authors admit that something has gone wrong with the premise. Rather lamely, they add "good news," however, rather like the night Saigon fell, when one of President Ford's aides came dashing into the room at the Security Council with the news announcing "I have good news and bad news. The good news is the Vietnam War is over. The bad news is we lost."[58]

The good news in this case was that cell biologist will keep their jobs.

The mathematician Hermann Weyl found himself in the same situation while revising a book originally written twenty years prior. In *his* preface to *Philosophy of Mathematics and Natural Science* (Princeton, 1949) he states:

"With the years I have grown more hesitant about the metaphysical implications of science; 'as we grow older, the world becomes stranger, the pattern more complicated.' And yet science would perish without a supporting transcendental faith in truth and reality, and without the continuous interplay between its facts and constructions on the one hand and the imagery of ideas on the other."[59]

Complexity was always at the center of the scientific enterprise. But it has always been with the hopes of *clearing out* the complexity and making it simpler. The grail has changed today, more as the biologists left it—certainly not as philosophically as Weyl, among the greatest of 20th century mathematicians, who puts faith *in mathematics with the sciences built on it* at risk, and offers another pragmatic and rational solution, where faith in truth and reality does not stand on science nor mathematics, but on the *interplay* between the imagery of ideas and the efforts at representing the truth. This is more Jamesian.

Simplifying complexity is not necessarily the be-all and end-all of it, as Weyl lets us know. Yet today there is a nearly forty-year-old research area called "Complexity Science," grown out of a surprising series of discoveries about the nature of *chaos,* and what is called "chaos theory." Briefly stated, it was discovered that when random processes were sped up to fantastic speeds in computer models that "randomness" did not follow the laws of probability as expected, but structural patterns shook out far more quickly than they could have *evolved,* that is, given the predictions of evolution.

This, of course, was extremely surprising…but it put the reliance on statistical interpretations of most complex reality at risk—and much of science depended on a statistical interpretation of experimental results. "Outliers" are supposed to be *at the far end of the curve,* and not predictable with a high frequency in the center—and yet, the curves that science had been discovering worked. They sent people to the moon. They discovered genomes.

And so the Science of Complexity was born, on the lookout for ways to track down this new grail. After all, these very discoveries in the world of chaos ought to give us a handle on the *causal* mechanisms that caused structural patterns, that ended with the kind of complexity that baffled the authors of our biology text. Evolution could be sped up, tumbling into shape in a reasonably short space of time--- coalescing not over trillions of years, but perhaps only a few billion.

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[57] Ibid., pp. v-vi. One might note here, that the closing hopeful note is that "we shall keep our jobs teaching new students, for we are coming to the conclusion this could go on forever."

[58] The quote from President Ford's Security Room is from his book on humor in the presidency (Ibid., p.128).

[59]Ibid. p. vi.

And our good news is that once we've solved the conundrum of "complexity" there is a limitless new horizon—for we must come to understand all the different types of complexity, the whys and hows of each of them. This is a subtle difference. It can be summarized with a quote from Brian Goodwin which I found on the cover flyleaf of Roger Lewin's book, *Complexity. Life at the Edge of Chaos* (1992 Macmillan): "We're not looking for the meaning of life,…[but more for] the meaning *in* life, the generation of order, the generation of pattern, the quality of the organism."

Having a new answer for *successive differentiation*—one that does not allow for such simplistic reductionist interpretation as "survival of the fittest" (whatever this is actually to mean in the wider sense of ecological sustainability)—is not the complete game-changer that we might expect.

Is it possible that disambiguation of complex structures that are "fit" for their context of use can be wrought, near-instantaneously, from the primeval muck?

We are allowed, with St. Augustine, to say *near-instantaneously* with the qualification of a few zillion trials and errors, "spontaneously" will be allowed to take into consideration as vast a swath of the Plenum as it takes to make things *work*.

This is the situation that modern complexity theory takes quite seriously.

The Failure of Evolutionism.

Stuart Kauffman's *Reinventing the Sacred* (Pantheon, 2008) is not so much about the sacred as it is a refutation of reductionist materialism. Kauffman is a state-of-the-art biochemist with a whole containership of arguments that aim at derailing the traditional scientific attitude. Kauffman merely says that the arguments science has previously given to deny the sacred no longer hold water.[60] There is something else to explaining "life, agency, meaning, value, and the still-to-be-clarified concept of propagating organization of process."

He doesn't take the approach of James' *Varieties of Religious Experience,* the option that "what men have long considered spiritual principles may have some basis in the structures of reality." James leaves the nature of the sacred untouched.

Kauffman focusses on the statistical assumptions behind evolution. These eventually derive from physics, and the definition one gives to entropy and the 2nd Law of Thermodynamics. Probabalistic method, if you remember (back to page 39) is what Norbert Wiener claimed in *Cybernetics* as the great accomplishment of Willard Gibbs, who firmly tied the underpinnings of mathematical laws to physics.

One of the discoveries in the new science of Complexity is that *seemingly purposeful arrangements* seem to connect up in a very non-probabalistic manner, defying the laws of entropy. What was once called "teleological!" and used as a perjorative explative in any academic argument is no longer.[61] This idea of subsuming teleology into scientific explanation was Wiener's innovation in naming his early version of information science "cybernetics," as derived from the Greek for 'steersman.' (a dictionary definition of *teleology* before Wiener's time would have referenced a Creator, or a meaning bearing on religious beliefs).

Information Science, or IS, has supplanted Cybernetics and any questions of teleology may be forgotten for the study of chaos provided a new way to speak of teleology, which was through the idea of an "attractor state." The modern term "attractor" applies a condition that seems, in defiance of probability, to come about –as if that condition itself is driving a reaction to catalyze a newly complex organization. The idea that these "attractor states" are "almost probabistic" is what gives it the feeling of a 'principle' or natural law, and very condusive to the goals of science.

From the standpoint of our definition of 'chaos,' complexity research has shown that extremely large, otherwise chaotic agglomerations of potentially interacting entities —being independent systems in

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[60] This is not the place to reiterate the evidences and calculations Kauffman has provided in his several books (*At Home in the Universe* 1995, *Investigations,* 2000 are two others I have perused less closely). *Reinventing the Sacred* is, like the others, a highly technical book, full of calculations, equations, and logical diagrams—none of which need to be referenced here. Kauffman works hard at constructing scientific counter-arguments in detail to bolster traditional materialist explanations, only to establish their explanatory poverty with his next example.

[61] **tel·e·ol·o·gy 1.** the doctrine that final causes exist. **2.** the study of the evidences of design of purpose to nature. **3.** such design or purpose. **4.** the belief that purpose and design are part of or tare apparent in nature. **5.** (in vitalist philosophy) the doctrine that phenomena are guided not only by mechanical forces but that they also move towards certain goals of self-realization.[Random House Webster's College Dictionary 1990 edition]

themselves, and having no predisposition for forming a marriage except in their proximity—will discover creative ways of hooking up to do entirely new things *that are sustainable, i.e. that can continue having children.*

This crude way of putting it highlights the near-craziness and rather astounding nature of experimental results that Roger Lewin, in his 1992 overview, *Complexity. Life at the Edge of Chaos* (Macmillan), was already able to summarize. These experiments, which continue being carried out in a wide variety of fields, are yielding similar curves for such creative, *emergent* "evolution." The curves represent a new context for probability, opposed to evolution driven by random mutation and survival rates in changing environments. They seem to show that there are laws that apply to the numbers of proximate independent systems (i.e. self-contained contexts governed by their own ordering principles), creating an "ueber-definition" of the field of interaction as a "new functionality," which in turn has a predilection to take over as the new governing principle—the new assembly language. It is as if there is something like a "contractual law" governing numbers and proximity—the definition of a field as an "ecology," independent of whether these entities are animate or inanimate, that will automatically hire a programmer in charge of integrating multiple software platforms—and figuring out the most efficient and marketable inter-relations.

The big question for complexity research is "how can such new functions be discovered in a random associational web?" And the driving intuition is that it has something to do with the nature of information—that, in fact, 'information' is the paradigm of "what organization is." That is, *information,* including the simplest constraints on transmitting it between systems and over distances without distortion, displays the same structural characteristics of *things,* i.e. of matter. Information reduces to representational strings that are conformable to laws of production and interpretability—and of course the entire physical basis of life is *encoded* in instruction sets.

It is an obvious intuition then, to look to expanding the definition of information to include the new probabilities of large n-dimensional webs of interconnectivity as the driving force behind purposefulness.[62] I myself have harbored many of the same intuitions, but my guess (based on *my* gut feel) is that we would only be switching one probabilistic method for another. Modern Complexity Theory is not *thick enough yet.* It does not yet challenge the mathematical basis of form and structure to meet Weyl's meaning of *complexity.* It is still *too logically bound up* in assumptions of causality and time (which is for Weyl, of the very nature of arithmetic, of set theoretic qualities, of symmetry). And all this is implied by in the conceptual framework that has shaped the modern intellect.[63]

The sciences of chaos and complexity are truly at the center of some broad new unification of science. At this juncture in scientific history…that is, at this juncture in the human quest for knowledge, the human question must be paramount—and such a unified approach to science is all that might carry us forward through whatever turmoil we have unleashed on this slightly bumpy still-spinning sphere. Yet here Comte had it right. Whatever we achieve in the way of knowledge must be reduceably simple and viewable in an entirely new light…from the human standpoint.

So the simplest critique of the current complexity paradigm (circa 2020) is that there is nothing childishly anthropomorphic about it. We must still explain it through Willard Gibbs and Claude Shannon. The goal is to reach a "simplification" that can be explained to the little boy or girl at bedtime, and again (from a new perspective) at any time in life. To understand the *theory behind* complexity should be to grasp a *theory of the experience* of being caught in it, to see the life's complexity unravelling just as it is tightening the screws somewhere else, and the vicissitudes of experience should highlight different angles on of theory.

I critique this argument from a different standpoint at the conclusion. It's in support of a reductionist and decidedly anti-intellectual, even *stupid* gloss—yet I maintain it is the additional constraint

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[62] for a history of IS relative to Complexity Research, see James Gleick, *The Information. A History A Theory A Flood.* (Pantheon, 2011)

63 I should not put it this way, but the temptation is simply overwhelming…and I would guess that the percept that leads my gut to its more rational conclusion concerning Weyl, is that the paradigm of neural nets (and the complex mathematics that underlies this new science) bears too much resemblance to the contemporary worship of the web and all technologies that tie us to our new source of consciousness, and the new paradigm of Strange Attractor States as directing the action.

of rigor that the knowledge trades (e.g. *wissenschaft, science*) must constantly apply to themselves if they want to get it right.

Back to the Drawing Board

James doesn't go this far. If he were with us today, and argued his points within the modern Weltenschaung of the dynamic process theory of Information Science, and the bifurcated physical theory of Quantum Mechanics, he should probably find everyone agreeing with him, *and yet still asking for a unified theory of everything.* My guess is he'd shrug it off and like Socrates and Lao Tzu, simply tell you a unifying principle is not to be found in any belief set at all—for even a successful theory that could take in the generation of complexity, both in physics and human experience, that could be demonstrated through proofs and experiments and equations, must itself rest in a belief-set that ignores many others.

If you insist on a unifying *principle*, you can only have it in the *experience* of it: experience it and the question will be instantiated or swallowed up in the experiencing. Only here will you find your unification *principle*, by happening to perform it…which is the methodology of asking and being.

I have not discovered him actually saying this anywhere, but it's my extapolation of a Radical Empiricist method, where the experiment itself precedes thought.

Methodologically, if we sidestep the search for an actual *law, set of laws,* or *principle* underlying the experienced order of reality by calling it "the methodology of asking and being" there is a critical problem, for it's self-referential. James was aware of this, and spends an inordinate amount of time on the demonstraton of shared realities, much to the detriment of *Essays in Radical Empiricism,* for in testing the outcomes of one's work we should expect that whatever one reports on is the same as anyone else shall report on. James knows this is critical for his method, but his solution is rather lame, and why he needs to make it is lost on the reader.

The problem is, the minutest differences in our reports will make it impossible to *prove our shared realities,* even that the differences are merely artifacts of the translation between perspectives and do not represent a unique and therefore different world. His "proof" is that when we shake hands—where our palms come together we accept a shared space and time, our worlds coincide on faith alone.

You must either give in and believe in a shared and unproven world, or rest content as a solipsist, having your own unique version of existence and yet somehow unable to make it bend to your whims. But it's hard to take this seriously as a proof. It unfortunately seems to be a facet of James' Pluralism, i.e. a unifying principle of sorts, that one must simply accept.

This problem, which I consider a particularly "Jamesian Solipsism," seems a major drawback. As yet I've not seen any contemporary critiques of Radical Empiricism to verify the impact this issue may have had on the future of James scholarship in the 20th century. I will take it up at a later point, however, since I believe it turns out to be a very important point, playing a very positive role in a pluralist model.

James was intimately familiar with conditions of the insane, who are after all, very real. So while he does not provide us with a satisfactory unifying theory—even a satisfactory unifying methodology, we know already he is quite against such superstitions.

PART 2: On Harnesses

'Harnesses' refers to James' discussion of concept-formation—of harnessing instincts and raw feelings available at the percept-level to turn them into concepts that can be put to use. These concepts needn't be limited to words, but may be entire systems, *the concept of new functions* and the tools to go with them.

We may very well have instincts and feelings about the percept-level of our experience that we grope around with, but never know exactly how to put these feelings to work….and that is because we couldn't find any appropriate harness to throw over them. Choosing an appropriate harness is itself specialized work. Are we hauling debris from the barn or turning the mill and grinding out work? Picture the differences between the old harnesses used for farm equipment, horse carriages, ox-carts or Roman chariots. If I saw them all hanging up on a stable wall I wouldn't know one from another. Knowing our analogy to harnesses has to do with 'harnessing chaos' we might forget about the mule and plow and think of harnessing a turbulent river for electric power, or harnessing the sun's energy for solar power.

Whatever the case, in talking of harnesses we're speaking of hooking up different structures in a toggled sort of way to do some very specific and technical work. This means conceptualizing the work, conceptualizing the means or effort (who and how and when and why it might be carried out), AND conceptualizing the toggle structure.

Toggled structure.

This term was introduced in the first half, as a concept to discuss association, marriages, and potentially measurable relationships of any type. It entails a notion of 'fuzzy equivalence' or 'substitutability by function.' The common-sense reference is to a toggle-switch which is not hard-connected, engaging a mechanism that swings a lever one way or another. The central motif in our use of the term is the phrase *not hard-connected,* but holding potential to make a change. It is probably not necessary for that change to be pre-defined in scope. We have spent adequate time discussing this concept above, p.41, when discussing non-commensurability.

The Ban on Metaphysics

Traditional metaphysics has for well over a century been banished from the academic realm by a kind of decree of science that holds that anything which physics cannot describe is not allowed any serious academic contemplation. Anything else is at best New Age banter, but not serious.

But early in the last century there was a very jocular solution to the taboo, suggested by Harry Todd Costello in "A Philosopher among the Metaphysicians"[64] He noted that the alternative that academics used instead of metaphysics was to demonstrate a model or simulation according to a fixed canon of interpretation. Thus one might discuss the rules governing the world at large by having a discussion about reality as it appears and acts, whether or not these appearances have anything to do with the laws of physics…thus talking metaphysics but avoiding the taboo. Such "things" as the economy, constructed of corporations which are treated as individual *persons* under the law, with the associated legal principle that spending money is equivalent to *speaking*, and that "freedom of speech" includes the protection of an investor's rights, can all be said to fall under the rubric of a 'metaphysics.' All this is according to the canons of modern interpretation, and though it is obviously not physics—we have here an acceptable interpretation of *reality*.

Unfortunately we do not consider them 'metaphysics.' Such "things" simply exist in a different realm of reality, 'beyond physics.' This is all that the prefix 'meta-' implies. And from this Costello derives a strong argument for <u>teaching philosophy in schools</u>, to give everyday people the ability to differentiate *the various levels of very practical unrealities* that suffuse everyday life.[65] To discuss such topics is clearly not *metaphysical,* and yet they do not belong to science.

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[64] pp.101-116, in *American Philosophy—Present and Future.* 1935., Horace Kallen & Sidney Hook

[65] Costello's point, made in 1935 and lost to the madding crowd of his limited readership even hot-off-the-press, was that this was the very reason philosophy should be taught, not as it is, as an erudite hero-worship of great minds that influenced history, but as the living stories about models—with reference directly to our current models—that any child is free to enter into and challenge and perhaps change. Education is about discriminating the real from the concept, which is a conceptual structure given authority by social consent.

Model-Building

I should want to characterize metaphysics as world-model-building. In this sense it is a 'technê'—metaphysical models like "corporation" constitute tools. With Marshall McLuhan, we must consider terminologies as much "extensions of man" as our technologies are. Model-bulding is a form of hypothesis, which is what James insists concepts are. Within the 'concept' of *model-building,* however, we must all types of representation, hypothesis, and fantasy, as well as train layouts and the painstaking craft of ships in bottles.

Conceptual Boundaries

For the time being, the *boundary of a concept* will not have a distinct inside and outside, but will be considered like a swarm of gnats, or darting school of sardines holding itself together and moving as a body from space to space. Those on the outside will not stray too far from the crowd, to get lost or eaten as outliers….and yet one can *see* a boundary, or state it as a function of the size of the herd, though it cannot be established. It is spatial, but neither distinct nor confined to a single 'dimensional space' such as GPS coordinates might provide, because the gnats or sardines are continually shifting their places in space.

When considering James' problem of conceptual distinctions, of 'making cuts,' we are not actually 'cutting' but only separating piles of things, often dealing with assumed edges—merely intuitive projections of already proven distinctions.

In the sense of our example, metaphysics and model-building constitute a concept swarm that I predict will never keep together but fly apart like many errant and bothersome fruit-flies, to bother us when we're in the middle of deep concentration.

Developing a Pluralist Model

The rest of this book is concerned with the building of a model within the constraints of a Jamesian pluralism. The task is to pick up where James has apparently left us dangling.

We must become clearer on the notion of *boundaries*. What he refers to as the 'act of attention,' I shall consider from the standpoint of *pointing*. Somehow, what James calls 'cutting' will become *concepts*. Returning to an earlier quote, in referring to what is taking place in the *flux* at the point of attention, James says:

> …Yet all these parts leave its unity unbroken. Its boundaries are no more distinct than are those of the field of vision. Boundaries are things that intervene; but here nothing intervenes save parts of the perceptual flux itself, and these are overflowed by what they separate, so that whatever we distinguish and isolate conceptually is found perceptually to telescope and compenetrate and diffuse into its neighbors. The cuts we make are purely ideal.[66]

The 'ideal' nature of boundaries, all boundaries, returns us to the notion of a decree, of claiming something pertinent 'by fiat'[67]—for it is both the nature of these 'cuts' that we establish concepts that may be tested *and through the tests,* if successful, given value and meaning. What it means to be 'successful' will become a very important problem in the nature and strategies of relative valuation. Indeed, we have no idea what these are, except, as James leads us to believe, it has something to do with how distinctions and discriminations take place in the flux.

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[66] *Some Problems in Philosophy,* (1940 edition) p. 49-50.

[67] Alfred North Whitehead's last book *Adventures in Ideas* (1933) spends inordinate numbers of paragraphs throughout the book waffling over Plato's forgotten concept of "the recepticle" (to be found in *Timaeus*) which Whitehead feels he must show is central to Plato's notion of the *ideal* (*and thus* central to western thought). He ties this 'recepticle' to the mathematics underlying the modern concept of 'flux' suggesting that theoretical issues underlying field theory have a direct relation to ancient philosophy, as well as to our intuitions for aesthetics or feelings. The critical issue is the assignment of boundaries by fiat, and the fact that they will generally submit to testing, verifying the boundaries of the field.

5. Paradigms of Discernment

William James, the Artist

Throughout his early growing up, and until he enrolled in the medical program, William James had been an artist, spending his schooldays at a French elementary school in Manhattan "dodging the books….and drawing and drawing."[68] At thirteen, his family moved to Europe; at sixteen, back in Newport, RI, he began hanging out at the studio of one of America's formost painters, William Morris Hunt, but after a year of apprenticeship decided 'talent is not enough,' and 'nothing is more contemptible than a mediocre artist.'[69] Then he enrolled in the college of science at Harvard.

For as we have mentioned, the key facet in transforming the pure percept as well as the imperfect perception into a concept that rationality can deal with is *taste*….and it is around a rather loose criterion for taste that James constructs his feel for *thickness*. It could also be argued that the reality of different tastes becomes central to James' construct for Pluralism. James is the hard-nosed pragmaticist wolf in romanticist's sheep's clothing. At the time William and Henry were considering their futures the Romanticist revolt against Enlightenment rationalism was at its apex. In *Making of the Modern Mind* (1926), Randall labels Romanticism as the "protest against the Age of Reason" formally opened by Rousseau (against his employer Diderot, in writing the *Encyclopedia*). He then notes the towering shadow that Goethe cast over the 19th century as defining the intellectual potential of the movement—for Goethe was to science and literature[70] what his contemporary Ben Franklin was to practical inventions and politics. We have already dealt with James' impressions of Fechner, who follows directly in the steps of Goethe.

In the theory of art, John Ruskin was the centerpiece of Romantic method—defining all artistic vision as an implicitly *moral activity,* as a work of discovering and demonstrating natural principles of balance, providing faith through the implicit beauty of laws that hold the universe together. This could be said to comprise a Deist, Unitarian, and Transcendental vision. Yet anyone growing up a painter from the end of the 18th century up to the 20th century would be sure to grasp their task as finding and expressing the world's beauties, assisting others in seeing them.

Seeing through chaos is at the very core of this particular artistic approach, and making oneself at home there might truly be said to describe the role of the 19th century artist—something which the young William James saw himself to be. So it makes sense to consider James' philosophy through the eyes of James-the-prodigal-artist.

The Art of Seeing. Paradigm I.

I once was a two-dimensional artist of sorts, eking a small living off my sale of watercolors in Southern France for a year after graduate school before returning to eke out life in corporate America. On retiring from the latter I discovered I could sculpt busts of composers, writers, artists, and other such cultural heros. In this field of creating 3-dimensional likeness of people from old photographs I can speak with some authority—having a visual dexterity with lines and angles and bumps. Together, I will claim some personal authority on which to support what I have to say about seeing, that is, my ability to critique what Sir Joshua Reynolds and Leonardo da Vinci and John Ruskin (who I shall discuss in depth later) have to say about seeing.

"Seeing" is one of the first metaphors we attribute to *reality*—"seeing is believing." In returning to James, *The Perception of Reality* argues that we shift between different ways of seeing that are mutually exclusive—and there is no better demonstration of this than in the world of art.

"Seeing" is also one of the most appropriate metaphors for "perspectives," where one considers different ways of interpreting or presenting what you believe you are perceiving—and this corresponds to

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[68] Barzun, p.10

[69] Ibid., p.14.

[70] I would defer here to Wikipedia. My knowledge of Goethe is only from two paperbacks—*Goethe as a Scientist* (Rudolf Magnus, Collier Books 1949, translated from *Goethe als Naturforschur,* 1909) and *Great Writings of Goethe* (edit. S. Spender, Mentor 1958.) Goethe's scientific scope led to foundational work in Geology, Botany, Osteology and Comparative Anatomy, Color Theory, Minerology and Meteorology.

the different kinds of functions we are attempting to intuit in choosing a harness to accomplish some kind of work.

Now everyone knows Leonardo, but few are aware that he filled his notebooks with advice for young artists, which was collected and republished in modern times as *Advice to Artists.[71]* His advice is full of "ways of looking at things" in order to accomplish different functions in art. Sir Joshua Reynolds was England's foremost portrait artist in the days of King George. He was dean of the English Royal Academy of the Arts, and from its opening in 1769 to his retirement in 1790, he presented a series of lectures at the commencement ceremonies. These were subsequently published as *Discourses on Art[72],* being a theory of the craft, aimed at the practicing artist.

And so, in the way of introduction, I will begin with a story from my personal experience directly related to Reynolds' advice to the students: *not to over-do the range of colors used on flesh once they got the knack of it.*

I understood this advice, but realized that many painters today –and certainly not the non-painter—would have known what he was actually referring to. His advice was given in a discussion of an "artist's eye for things." He has just described the history of painting, in which all faces were painted in a single color because the pre-Renaissance artists "painted flat" and had not learned to *see* how many colors were actually there on a face. Now to the non-artist who is familiar with the history of painting, you would read this and say to yourself, the early primitive painters didn't see the shadows or the continuous darkening around the curves that gives 3-dimensions, "they painted flat." But this is NOT what is meant by "painting flat, using only a single color," for Reynolds means the use of a single tint that is both lightened with whites and darkened with siennas, blacks, or purple-grey hues. For the early European "primitives" like Giotto certainly knew how to shadow and *round* solid objects. What Reynolds means when he says "they didn't know yet how to *see* all the colors" this is *exactly* what he meant, for there is practically an entire palette of color found in the reflection of light on skin. And if you look for a Reynolds painting in a museum (in fact nearly any painting in a museum a hundred years after or two hundred years before Reynolds' time), and you put your face two feet from the canvas and inspect the brush strokes to convey skin tones you will see greens, and blues,and ocres and oranges and purple sploches alongside the many hues of peach and pink and tan fleshtones. This is not because they had learned pointelism before Seurat invented it—it is because if you were an artist of the old school you had learned to notice that these colors *were actually there!* And this is what Reynolds is referring to when he said *not to over-do the range of colors used on flesh once you got the knack of it.*

As a youthful budding artist, I had often inspected the brush-strokes of old paintings and could never figure out how these old masters invented pointilism before Seurat. It was a total mystery to me how they ever decided to use the colors they did on a face. Until the following funny experience taught me how they did it.

I was commissioned in my youth by a wealthy young friend to paint a mural in his kitchen area. Imitating the dulled-down hues of the many surviving WPA murals in public buildings I'd seen, I designed the mural in a range of pastels that could be mixed with white wall paint and bright acrylics, and I went to work…very quickly, and over a day and an entire night finished the wall. Having worked a straight twenty hours painting *very flat* and *very two-dimensional* version of a WPA mural of workers and factories and clouds (in quite the way that Reynolds describes primitives as 'painting flat') I walked out into the bright sunshine of the city and was immediately struck with the fact that my eyes converted all color into two-dimensional planes; everything around me appeared to be through an old 'stereopticon' or the 'Viewmaster' toys I'd grown up with, that directed two slightly offset images of the same view (taken by lenses substituting for two eyes) to to grossly reproduce the process of seeing in 3-dimensions when you viewed them through the two eyepieces of this clever doodad.

The stereopticon did not produce a *real* 3-D image, because real eyes are constantly scanning back and forth at a very rapid rate, and thus overlap edges—the pseudo-3-D of the stereopticon differentiated every object in the scene from its immediate environment as if it was on a sheet of paper a few millimeters

[71] Edited and annotated by Emery Kelen. 1974, Thomas Nelson Inc.
[72] my copy is the Collier Books paperback edition, 1961.

in front of what was around it. And this is exactly what the buildings and clouds and autos and parking meters looked like to me, as if they were all paper cut-outs.

Having spent twenty hours converting things *the other way around* from 3-dimensions onto my two-dimensional version of it, my protocol of vision had become oddly altered, and I couldn't see things normally. It was instead suffering from a mild hallucination (the stereopticon effect) that was only somewhat bothersome. At least that was my first thought. Then a *very* good friend happened to walk across the street and come over to say good-morning. I was totally surprised to see her face completely plastered over with make-up, as if she was about to go on-stage under bright lights. Maryanne never wore make-up at all, and I asked her what was going on. She denied having put anything on, which I didn't believe until I touched her face and looked quite closely and suddenly realized that it was just like looking at the brush-strokes on a Sir Joshua Reynolds' portrait!

And this is what was going on. My eyes had apparently taught themselves to decompensate for the rapid eye movement (REM) scanning that blends together dimensional sight—and it had done this while having to adjust and build pseudo dimensional figures using only a pastel palette of color-tones. NOW I was being allowed to see *reality* as if it were a canvas, with all the color boundaries sharpened. Without the rapid-eye-movements to provide continuity and do the blending, the colors in my field of vision were *all* discontinuous.

What made up the flesh-tones of skin was, in fact, the mapping of a more three dimensional view than I'd ever been aware of, for I could actually see the bluishness of veins distinguished from the red of capillaries, the whites and silves of dead cells flaking off, the glistening of dust caught up in a hair, the off-colored ocres of freckles of all sizes, etcetera.

So when Reynolds warned young artists against *over-accentuating these differences* as a source of bad taste and vulgarity he is assuming that by this time (for his talk was being given at their graduation ceremony) every student already had developed this knack of seeing things that had just overtaken me that morning.

Now interestingly enough, as the effects of my all-nighter wore off, I found that I could recall my two-dimensional vision at will whenever I was painting—I had learned an additional protocol for sensing light and distance… something between single-eyed, double-eyed, and treble-eyed vision *which I could turn on or turn off whenever needed.* This supports what comic-book writers have long intuited, that Superman doesn't *always* see through everything…to do so would be so distracting as to be entirely debilitating; he only has X-ray vision when he needs it.

Let us now turn to the more classical critique of *seeing.* Leonardo DaVinci's advice seems straightforward enough, it is to combine rational rigor with all one's seeing, so as not to reproduce what you *conceive you are seeing* but rather what is there, and what must be there given close inspection. To illustrate this, he shows innumerable ways that noses may be attached to the brow—because if you didn't know this you might always assume, and therefore only see the brow as attached the one way you always drew it. But if you now take this a step further, you will see there are fixed variations to all brows, just as to all noses. Similarly there are eyes and ears of a broad range of types which you can draw separately and list in tables on a sketchpad that you keep with you. And this is what is very interesting in Leonardo's way of seeing things, for if you have already done an inventory of all the basic noses, and all basic brows, as well as jaws and chins and ears and things like this,…and if you have them drawn carefully in numbered tables in your notebooks, when you are studying someone of interest that you would like to paint, if it is improper or impossible to sketch them on the spot, you can simply note all their associated features on your tables and reproduce them –not from a mere impression, or your imagination, but with all the strength of your earlier detached analysis!

In this way, DaVinci's advice to young artists is full of such tables and lists. Standard combinations of the facial muscles create and convey different emotion, which one can best study by sketching the communication of deaf-mutes who convey meaning with archetypal expressions. The depiction of motion must similarly be supported by a prior analysis of balance, weight, and forces being applied, to which all the studies of the skeleton and muscles must be added. The various ways in which different fabrics lay on a body or table, to depict the light on folds and the depth of the supporting framework can be treated in the same way. He notes that fabric doesn't require the same detail as representation of posture and body structure, for everyone is already a specialist at seeing and evaluating

the veracity of these qualities in a painting—so even if they can't tell you exactly what's wrong they will know it is wrong.

Now my personal story regarding all this good advice is that I am *not* a painter of human figures because I have never taken the time to do everything that Leonardo suggests. And because I didn't go to art school in the 18th or 19th centuries I only learned to see colors by accident. Thus, I am constantly frustrated by my inability to properly render figures, and stick to busts in my sculpture because I do faces but cannot *see* bodies cleanly, without a pre-conception that distort swhat I *think* I'm seeing. So anybody can tell I'm just clearly wrong and just an amateur.

This is exactly what James describes as conceptual "reality" interpenetrating the actual *percepts* of reality—what the senses record is passed through the conceptual framework, *and we begin to process the conceptual framework in conjunction with the reality as if they are the same.*

Leonardo's advice is to make sure, before you attempt an artistic statement, of sorting out the conceptual from the perceptual. You may do the conceptual work first, but when it is time to perceive—let that perception be free. Returning to James:

> "The intellectual life of man consists almost wholly in his substitution of a conceptual order for the perceptual order in which his experience originally comes. …Percepts and concepts interpenetrate and melt together, impregnate and fertilize each other. Neither, taken alone, knows reality in its completeness. We need them both, as we need both our legs to walk with."[73]

The Art of Interpretive Discernment. Paradigm II.

Art provides us with another way to discuss the conversion of percepts to concepts that are communicated in some *relatively* precise fashion. Whether through the traditional arts of dance, sculpture, literature, film, or painting we might speak of "communicating" something in a 'relatively precise' fashion, and discuss what it is that might be communicated. Industrial arts may be included here, so that we might ask what it is that is communicated by a car model, or an expensive pair of designer sneakers, or for that matter, the knock-off. Unless we are speaking of the art of diagrams such as you'd find in *Scientific American* or *National Geographic,* what the artist communicates is quite imprecise. The sneakers and the auto might be better compared to a dance number than the art of a painting. Similarly, the painting of an event, such as Napoleon's coronation by Jacques Louis David, or a ghastly photo of death is a picture worth a thousand words—but no two version of those thousand words would not be the same. So to this extent the picture is still only relatively precise, being entirely ideosyncratic.

The Cult of the Artist

What has been called "the cult of the artist" began, at least for the modern age, around the mid-19th century. The essential form of the cult is to say that the artist represents the forward phalanx of human evolution, that the artist's productions are to be respected as "sacred" and prescient perceptions of human truths, an eccentric but pervasive belief that artists perceive the truth before anyone else.[74] In *Strolling with William James,* Jacques Barzun, the cultural historian, treats the cult with some minor irritation. It was not yet, he says, in full bloom at the time William James grew up, but that by the end of the century, the works of his younger brother Henry James were a clear product of it.

The reason for this misconception is because the artist deals and trades in the communication of perspectives…of 'ways of seeing and interpreting.' In the modern "culture of art" doing art is an exercise—a gymnastics of eye and mind—in which one declares that subject and object are amorphous and must be reconstituted anew, i.e. *creatively.* It was not always this way, for to consider creativity more like a health-sport than an avocation for the dilitante or a compulsion for the obsessed took a century of culture led by the rise of a leisure class.

And yes, we can read into this the presumption that art imitates the very act of creation, extracting form from "chaos," it essentially parallels what Augustine calls the ongoing work of God's Creation. At

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[73] pp. 48-53, *Some Problems in Philosophy.* Chapter IV. Footnotes

[74] Karl Popper, best known as developing a philosophy of science, waxed visceral over it in his semi-autobiographic essay at the end of Schilpp's *festschrift* to him. He describes a confusion between Spencer's social Darwinism and its cross-fertilization with Wagner's Aryanism having created the cult proclaiming artists (not scientists) as the most fit vanguards of society. This is echoed in McLuhan's philosophy of culture, but as will be argued here, it was really due to Ruskin—whose model of the artist must be consistent with that of the scientist.

one point the cult made the artist and his or her art a sacred work, but we've outgrown that. Creative re-creation has now become the epitomy of a health-sport, a central purposeful hobby that provides mental balance.

Of course we now accept the cult as bosh, but have not done away with calling it sacred. Idealizing such incredible conceptual creations as Cristo's "punctuating human history" "expressing the momentary and ephemeral" lends force to the avocational and democratic aspect of art—we may all participate in such works as Cristo's with the identification of spectator sports. Cristo's massively useless creations *are* art, but they are neither prescient nor any more sublime than a poem contemplating the same truths for a hundred million dollars less.

What is interesting is how our modern cult began. Our is not the first time nor the first __cult__-ure in which recreational arts are confused with the highest acts of the gods.

The current cult can probably be attributed without the slightest exaggeration to the romantic 19th century philosophy of John Ruskin. His *Collected Works* went through many popular printings, with ostentatious spines and cheap reproductions inside. Ruskin arrived on the scene in the 1840's as the premier champion of the highly impressionistic paintings of J.M.W. Turner. It is Turner himself who was portrayed as the prophet and reformer. Turner directly challenged the reproduction theory of art—his paintings from the 1830's were expressions of color and form, often more impressionistic than any of the later Impressionists—yet Turner also opened the way to Romantic Expressionism. Were it not for Ruskin, Turner's works might have disappeared onto a few private walls by the 1860's in silence, and the Impressionists would not have had such ready support from the larger intellectual community. Despite the conservatism of the academy and critics, their expositions did not become sensations in a vacuum. Ruskin had prepared the stage. His approach to looking deeply, reading deeply, and acting with the deepest understanding of one's aesthetics of truth and beauty showed that the artist must push at the boundaries of perception to grasp what it is he (or she) is putting to their creation.

Ruskin has been consistently overlooked by the 20th century, and will doubtlessby be forgotten by the 21st. However, his works should be considered the foundational studies underlying all artistic appreciation of the 20th century, as well as much of 20th century humanism and learning theory.

The Stones of Venice (in 2 volumes) develops the connection between the overall form and flourishes of architectural art –showing how one looks at the arts of building to understand specifics of what is meaningful to a culture. Ruskin includes all that Marshall McLuhan needed a century later to demonstrate that *anything made by humans can be considered an extension of their self-image—our technologies as well as our structures are declarations of our cult of what is sacred to us, our meanings.* And yet, it takes more than a rhetorical statement of that kind to make the case, and Ruskin takes two volumes to show a person the art of seeing and interpreting the many aspects of *meaning* in structures.

Modern Painters (in 5 volumes) outlines not only Ruskin's theory of aesthetics, but that of perception and the means of seeing nature. A course on geological formations, and the structure and reflective qualities of different rocks is included. The modern painter cannot be considered modern if he or she doesn't represent a cliff faithfully…for an artist such as Turner is a *discoverer.* This follows directly in the tradition of Goethe, who considered himself a scientist. One of his over-riding passions was the theoretical basis for construction of the earth—seeing in the layering of minerals and strange formations of rock clues to interpreting God's first works.[75] Just as Augustine struggled with the opening text of the bible and the notion of creation, such Deists as Thomas Paine and Ben Franklin saw every question into the oddities of nature as experimental enquiry. Thus, to be curious enough to look at things carefully, to pay attention, was to become a participant in that great human saga of knowledge work (*wissenschaft*) called science. Goethe defined the age—anyone reading Ruskin knows he's merely carrying out Goethe's aesthetic game-plan, showing us how to connect all things together as that great Faustian sage had, defining life through a demonstration of its fullest potentials. Ruskin's life work was to show us how to look at things carefully, to pay attention, and thus by extension, to live life to its fullest.

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[75] Paracelsus, the famed wandering alchemist and possible model of the Faust legend, made his way around Western and Eastern Europe and Russia as a mining specialist. Clearly, his interest in the origin of various ores led to theories of their creation…and possible transmutation from "lower" to "higher" metals. The higher end of 'alchemy' was not, as the cartoons tend to portray it, as the realm of a belief in magic; alchemy was driven rather by a faith that structure and form had a close connection to function and value. I expect that this gloss is very close to a simplification of Ruskin, and indeed, to what we shall see is the driving concept underlying 'thickness.'

It's in Goethe's shadow (along with contemporaries of that bursting forth of the Enllightenment ideals; folks such as Franklin and Rousseau, charting a life of *total* socio-political-cultural-scientific engagement) that we find the model for Fechner, and finally James. So we can presume to find in Ruskin clues to what *thickness* might mean, and what its analysis entails.

Modern Painters drills down to the chemical composition of the tints used by different painters to achieve different or similar effects, and of course this needs to be understood from a historical perspective. It's clearly not possible to explain how to look for a certain blue that artists had at their disposal after certain mines were opened in Switzerland if you don't know how to look at the blues that were design constraints to artists in previous centuries.

Ruskin's depiction of an artist's creation is as much about the total balancing of beauty and reflection as it is about the beauty of the nature it depicts. *Elements of Drawing* is exactly what it purports to be, with a lecture quite like that of Da Vinci, but devoted to seeing, sketching, renderings of leaves, forests, grass and water, perspective, etc. Ruskin devotes whole sections to the development of knots on a tree, and the molecular structure of bark and why it reflects light in different fashions. The rendering of shadow (*chiascuro* technique) becomes a lecture on understanding light and the essentials of color perception (another of Goethe's favorite topics).

The Two Paths is a discourse on art for decoration and manufacture, covering aspects of symmetry—connecting through the allusion to balances such ideals as ornamentation technique to the ethics of 'right' and 'wrong;'the "two paths" referring to 'fitness' vs 'vulgarity.'

The Ethics of the Dust. Ten Lectures to Little Housewives on the Elements of Crystallization is another effort in this vein, but in a somewhat clumsy and didactic storybook of a dialogue carried out between himself and a group of students at a girls' school. Here he drops all allusions of scholarly presentation and provides the very ideal of James' 'thickness.' Here we find Ruskin addressing the simple questions of a group of adolescents…in the very style and with the very words he used with smart kids at a boarding school for the wealthy. He jumps between questioning the behaviors and prejudices he observes between each other, jumping to parables of mythic gods of old Europe, Greece, or Egypt, and thence to the principles these gods had represented in their culture of origin—and from here he goes directly to examples of structure drawn from the rock specimens he pulls from his pocket! From here, he jumps to the art of interpretation—that is, to examples drawn from paintings these kids had been taught as part of their art history classes.

The True and Beautiful (in Art, Morals, and Religion) (in 2 volumes) is Ruskin's discourse on valuation…that is, of his philosophy of life's ordering principles. *Sesame and Lilies* is a lecture on the use of books, of the interpretive work one must be prepared for to properly *read.* He spends five pages on that many words in a poem by Milton, showing how the poet chooses them and places them as he does, their literal sense and the history of prior allusions in religious usage—his demonstration leaves nothing to doubt as to Milton's meaning, which the simplest reading *already* transmits, but with Ruskin's eluscidation we find it reverberating in multiple harmonies of sense, so that to read Milton becomes an exercise in surveying the foibles and glories of humankind, to see things perhaps as Milton saw them.

But Ruskin isn't content with the exercise, nor with the foibles and glories of humankind. His energy is put to having us appreciate the very act of reading—of learning to communicate with long-dead authors through their works. After what *seems* like the idolization of a particular poet, he throws the whole thing off casually, as if Milton's viewpoint is well-worth having, but hardly better than anyone else's artistic opinions on life. He harangues the reader as having no special ability to form opinions, as having anything worthwhile to say unless they have learned to first listen, and through the work of reading (listening) interactively communicating with other authors. He goes so far as to say that the greatest sages will have little more than opinions about subjects, and that for the most part can only turn *our* questions into *pertinent* questions. That our goal in reading an author is to attempt to grasp their feel, their sensibility towards a subject. For Ruskin's criteria of the good and the right is tied into an idea of the sensory depth one gives to one's subject—the attentiveness and breadth of focus that you bring together into the act of looking. What is vulgar and coarse is characterized by being 'blunt' and 'dull,' a tool that can only rip and shred but never dissect and be used to correct and cure.

Ruskin's organizing principle seems to be an ethics that recognizes anything leading to disintegrative processes as 'corruption, a negative force that can be associated with evil. He tempers the over-simplicity of this with an interesting analogy to the nature of structure and order; it might just as well be used as an argument for pluralism. At the end of *Ethics of the Dust* he asks one of the girls to read from another book of his, a section which he calls "The Law of Help." In it he explains his metaphor of 'the dust,' leading the reader through a discussion of the constituents of rain turning a dusty path in a manufacturing town to slime. Being very specific to keep organics out of his analogy, he puts the slime through many ages, and processes by which he describes it sorting out by weight into sedimentary structures of elements, which under pressure he describes as forming the various jewels--- saphires, opals, diamonds, and with characteristic aplomb he has the evaporated water come back to us as snowflakes!

Which presents a picture of that philosopher who, more than anyone else shaped our modern culture of the arts, defined the artist as the prophet and seer—but whose criteria for true art was as tight (if not ethically tighter) than the criteria for doing science. Scientists have experimental proofs to verify the precision of their methods, and artists have nothing but ethics to call them to task. Which says we'd better not trust our future to far-seeing artists any more than short-seeing scientists.

Interpretive Gestalts – More than the Sum of the Parts

Von Ehrenfels' Qualities

The philosophical problem of discernment, of 'naming things,' and of perceiving and assigning qualities has been a central springboard for philosophers for centuries. In 1886, in his book *Contributions to the Analysis of Senses*, the physicist Ernst Mach introduced the idea of gestalt perception—supporting the naïve belief that we might simply "see things as a whole," grasping them directly. This ran counter to the existing scientific intuition that all the constituent parts of a perception were handled by different sensory functions and brought into an organized pattern by the coordinated mechanisms (organizational rules) of cognition. Mach used the term 'gestalt,' which meant 'shape' or 'form,' to imply that quality which might be recognized at a glance--such as a melody, which could be played or sung in any pitch by any configuration of instruments or voice, and recognised and sung along by anyone who knew that melody.[76]

The simplest way to put this is "the whole is more than the sum of its parts." From the standpoint of *our discussion* of how concepts can be distinguished from an amorphous field of sensory percepts is to say that the concept is not a collection of percepts, nor can the percepts be taken as merely "constituents"of concepts stiitched together into a whole by cognition.

Mach did not go on to develop the idea, but it was taken up, expanded on and expounded by Christian von Ehrenfels, a rather independent Austrian generalist philosophy teacher who also studied composition under Anton Bruckner and wrote librettos for Wagnerian operas. It was Ehrenfels who made the rather surprising logical, if not common-sense discovery that Mach's conjectures could be applied across the board to nearly *any concept.* Though he published his first article on Mach in 1890,"Über 'Gestaltqualitäten'" ("On 'Gestalt Qualities'"), he spent the rest of his academic life writing works on morals and religion that used this idea of 'gestalts' as the central pillar of human cognition and action. And while his philosophical opus is largely forgotten, he is recognized as providing the basic challenge to psychology, and yeast from which the school of Gestalt psychology rose. The points he made could not be ignored, and Wolfgang Köhler, the central American figure in the Gestalt school, returns to his examples throughout his works.

Edmund Husserl picked up on Mach's *gestalten* the same year as Ehrenfels. A central characteristic of European phenomenology takes this idea of *direct perception of form* as a central tenet, to become *the thing in itself*.

Gestalt psychology asks a number of new questions about the ways in which we define things—which is only another way to say *how reality becomes defined for us*. As becomes clear from some of these 'riddles,' the reality is allowably more fluid—it is quickly shift-able, and quite open to James'

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[76] Mach's conjecture was that we perceived (e.g. could recognize) spatial shapes and tone shapes directly. Stanford Encyclopedia of Philosophy. Christian von Ehrenfels. Indiana Philosophy Ontology Project (InPhO).Copyright © 2015 by Robin Rollinger <robinrollinger@yahoo.com> Carlo Ierna <carlo.ierna@phil.uu.nl>

pluralism. The Gestalt paradigm can be grasped from the questions, without going into any expansive discussion of the school's tentative answers.

If the recognition of forms, such "ideals" as letters, dependent on a central coordinating mechanism, the coordinator should have to know all the possible ways to distort an "n" or a "t" to distinguish them as those letters in any size or color or scribble, within any spelling configuration to automatically assign it its role as a letter. Not only this, but whole words might be deformed and half visible (for example ripped on a bill-board) and we could recognize them for what they were.

A central problem with music exists in identifying the basic element of form. Rhythm, harmony, and tone have always been basic elements of music. But the interplay of options that combine these three are multi-dimensional, and yet our perception sorts the combinations into features and shapes with

Kohler often returns to the example that a single note among a group in a melody or a chord can indicate a minor key, which substantially alters the form or 'shape' of the element. The opening note in a tune often indicates the 'tonic,' a place to which *our perception expects the tune to return.* What is this expectation about; indeed, why should it occur?

A simple melody, wandering up and down over a scale, separating notes in terms of attention stature by their length and interval relations to adjacent notes, and the repetitive intervals between meeting them again—all imply a chordal structure, which is in fact a choice of chord progressions. Thus, a simple tune can be compressed into a chord-set. It sometimes implies a rhythm-set. The tone, a string plucked by itself, sets up overtones—which are its own self-defined harmonics, and the harmonics are tied to mathematics—Pythagoras conceived the harmonic relations as perfect and enduring, having developed what the Egyptians had noted before him. The harmonies are *perceived* as wholes, and can be experimentally shown to induce certain feelings in a statistical number of subjects not otherwised trained to recognize harmonies. So our interface with musical sensation would seem to imply that we are pre-programmed to recognize all of this—only the combinations are endless, and the structures seem to be recognizable in the same way as geometric shapes are reconizable.

The simplicity of the conjecture about ideals—which comes back to the belief that mathematics is the key to all form, and that we can somehow intuit it through our basic programming-- is somewhat marred by the facts.

Hermann Helmholtz's 1862 treatise, *On the Sensations of Tone,* experimentally tied the physics of tones to the way we sense them. His specialty, as an experimental physician, had been to understand the structure of the nerves, the ganglion, and their transmission of information through the nervous system. The Pythagorean nature of tonal recognition would be a perfect place to qualify the ideal assumption against reality. For it was well-known to scholars that the assumption was wrong– "the tempered scale" had been discovered by Western music in the late Renaissance, wherein organs and other musical instruments could be tuned to work together in the audible human range. In the ideal scheme, as Pythagoras laid it out, all tonality is relative, so that the relations between harmonics produced by the overtones are the same for every note up and down the scale. Helmholtz proved why they are *not* entirely relative—what instrument tuners had discovered over the centuries. He explained the *art* of tuning instruments in different auditory ranges so that the ear *hears* the harmonics more clearly, noting the different interactions of frequencies—the timing *beats* generated mathematically where frequencies intersect. These beats are used, for example by piano tuners, to distinguish a pure harmonic, and these beats, along with the tonal frequencies are transmitted to the ear, and the particular structure of the ear, through the medium of the air. And so Helmholtz, demonstrating the most acute and ideal methodologies of science, dissected the sensation of tone down to its minutist particulars, such as the frequencies that tuning forks of different purity will vibrate at.

Someone like Ernst Mach, another physicist, would naturally see that the deconstruction of the acoustical problem into all its interacting components only highlighted the amazing abilities of human aesthetics to integrate all this in such a fashion *that we perceived harmonics as ideal,* relative across the continuum of sound *as if none of the intervening translation issues* ever got in the way to distort things.

My guess is this. He read *The Sensations of Tone* and wondered if perhaps we were able to construct these ideals 'on the fly.' We make a guess and establish the 'ideal,' which is to be verified by whatever means he have at our disposal. We don't have to know all the intervening acoustical facts, nor know anything about our unconscious sensing of the beats…any reason to verify our conjecture is good

enough. Which means that we might be open to any other perceptive clue for help. Which is when he asks the next question about the linear nature of music, over and above its tones and overtones. For then Mach discovers that with this question, there is no way at all to decompose it to its physical and mathematical pieces. Helmholz has provided factual data regarding the overwhelming complexity underlying the "simple" senses of tone, which from the times of Pythagoras had been easily reduced to the elegance of mathematics. The elegance was suddenly gone. As of 1862, for those who were not otherwise overwhelmed by his erudition, Helmholtz's work proved that the principle question was how our bodies had ever been programmed to immediately and instinctively *integrate so many realms of sensing!?* In pushing

By extrapolating this question one level up the hierarchy, from tones to *musical structures,* Mach showed that the question itself became trivial. There was no possible way to suggest a programmed solution to integration at the next higher level of tonal perceptions. If we can develop a theory cover the integration of perceptions for the simplest question "how do we recognize a melody?" we might have a conjecture to cover the idealization of tones and harmonies as well.

"When the Gestalt problem first arose, nobody could foresee that later it was to be closely related to the concept of dynamic self-distribution; nor were the facts of sensory organization immediately given the central position which they deserve. The actual starting point was the observation that sensory fields exhibit characteristics which are generically different from the sensations of traditional theory. It was Christian von Ehrenfels who, preceded by an observation of Ernst Mach, called the attention of psychologists to the fact that perhaps the most important qualitative data of sensory fields had been entirely overlooked in customary analysis.

"While a sensation is supposed to occupy its place in the field independently, i.e., determined by its local stimulus alone, the curious thing about the qualities which Ehrenfels introduced into scientific psychology is their relation to *sts* of stimuli. Nothing like them is ever brought about by strictly local stimulation *per se;* rather, the "togetherness" of several stimuli is the condition which has these specific effects in a sensory field.

"As an example we may take a glass of water in which soap is dissolved. The appearance of such a liquid is in German called "*trübe,:* which in English means something like "dim" or "turbid." However, if we isolate a small spot of the visual situation by looking through a small hole in a screen, the hole will be filled with a certain nuance of gray (which may have a bluish or reddish tint); the quality of "dimness" or "turbidness" will have disappeared. This characteristic occurs only as the property of a more extended area; it depends upon more than local stimulation…." "The Characteristics of Organized Entities" p. 102 (Chap.6 *Gestalt Psychology,* Wolfgang Köhler, 1947 Liveright.).

What Köhler clarifies is that the entire field is concerned with the fact that qualitative distinctions are made through our ability for *integration,* and that the analysis of such distinctions *does not go the other way*….that is, disintegrative analysis breaks down.

…We need not consider [Ehrenfels'] qualities in order to learn that analysis in an extreme form will sooner or later make understanding of certain facts impossible." (Ibid., p.103)

Von Ehrenfels was to take his Gestalt qualities to the extreme,—to include all thought and experience whatever—applying the principles of Gestalt conception recursively to itself. Gestalt psychology ignored Ehrenfels' unification thesis, but took the problem seriously. Somehow, component structural *shapes* or *forms* were perceived and processed in a *set-wise* fashion, such that their relative organization was critical to the form. Shuffling up the same set of components changed the form. Not only this, but the *context of a theorized form or ideal* represented one of the perceived components of that form. This is to say, the components of the "figure" at the focus of attention *included the components of its background,* known as the "ground." Gestalt

psychology became known to the outside world as the experimental territory of Figure/Ground studies, where slight shuffling of ground components (color or shape) might suddenly create the perception of a new figure. The most startling of these cases, of course, were where the figure and ground became swapped—where you saw only one 'figure' at a time, and two persons might see entirely different things when looking at a simple page, unable to convince the other of what they saw.

Most importantly, Gestalt psychologists established a realm of cognitive science. They established principles by which the physical senses were translated, to be recomposed through the logic of the psyche; the feelings of softness, smoothness, roughness, as well as visual perceptions of fuzziness, straightness, roundness, thickness, sharpness were integrated and recognized in the same way as a melody. What remained to uncover were the various standard grammars, or structural protocols, that could perform the integrative recomposition tasks at any level of the structure.

As an experimental endeavor, measuring thousands of subjects' interpretations of thousands of component permutations led to lots of knowledge about the realms of individual differences in psychological make-up, as well as to extrapolations into other realms of psycho-logical idealization in concepts regarding experience. However, just like Helmholtz's researches eluscidated problems in over-simplification of Pythagorean harmonics—and the illusion that through music we could sense the universe's perfection, his work revealed altogether new and uncharted territory in the science of wave propagation, and the new types of measurement that could be carried out in physics. Old assumptions with simple laws were jettisoned, but newer laws were discovered that integrated more realms of experience and life. The connections were no longer geometrically perfect, but were reproduceable and led to new verifiable predictions.

I would add my own conclusion here, that we have two particular instances in which science and understanding progressed –where what had been considered the most "logical" answer, based on simplicity and elegance, broke down because the experience under consideration straddled two different realms of order or reality. The break-down was because the relations between these realms was *toggled* and not one-to-one, or perfectly-mapped. They were, after all, discrete realms of physical or experienced reality. In Helmholtz's case, he knows he is dealing with acoustics in the physical world, and the direct translation of that into discrete packets of information in the senses, to be translated *again* by the cognitive function of the cerebral cortex. These are all discrete systems, and they are discrete *because there is no apparent continuous function connecting them as a system.* Therefore, the translation of components one to the other will be as structurally close as possible, but we cannot expect them to be one-to-one. And indeed, the physical constraints that apply to the chemistry of molecular interactions, and relative frequencies to be found in this realm, carried over to the vibrating frequencies of the tuning forks, and the complex mathematics integrating the intersecting frequencies, up to the characteristic waves through the medium of the air and impacting the tympanum of the ear—all do the best approximations possible, rather like "rounding to the nearest fraction." Now at certain places on the chart of frequencies, in each of these translations between realms, there will be a consistent discrepancy, because one side must round up while the other side must round down. The mapping translations aren't perfect or continuous, and at each translation several more inconsistencies accrue; but there is another pitfall, in that the discrepancies might balance out, covering up the loss of information.

Nevertheless, Helmholtz's works led to discoveries about new distinctions, or 'realms of physical reality.' The work on the propagation of waves in a medium led to discoveries regarding air currents in the upper atmosphere, for example. The volume of experiments in Gestalt Psychology made new distinctions in the structures of cognition, discovering neurological components in the physiological structure that explained certain consistent results.

It is perplexing, but should not seem odd that whenever new principles have been discovered that related two or more realms of experience, in fact expanding the *unity* of our grasp of reality, that the explanation of the specifics of experience should grow ever more complex.[77] It is perplexing, but quite

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[77] The case of Einstein's famous equation tying matter to energy in a seemingly perfect fashion hides many of the mathematical steps he used to demonstrate the equivalence—so when you understand what holds the ideal case together (which indeed it physically proves out in the case of atomic energy) you see that the inconsistencies relate to the speed of light, and indeed, to the very notion of "speed" in space, which

understandable when you realize that the realms we can now "firmly and without hesitation" connect, can only be done so in a toggled fashion—they are organized according to different hierarchies of law, they coexist as the roads on a map—one under state authority, another under city authority, or federal authority, or county government, subservient to different insurance codes, policing standards. With such outright discrepancies as the fact that on a federal beach you cannot be legally arrested for nudity. The more universality one recognizes, the harder it is to administer local cases, which are by definition, unique.

A Problem with Paradigms

A Story of Learning Drag

Throughout the 1980's I worked in the industrial field of training technology in a large engineering firm specializing in nuclear power. "Continuing Education" in our office was tasked with implementing the supervisory and management training eminating from corporate headquarters. We also dispensed and monitored training budgets for individual engineering and design specialties.

Just prior to 3-Mile Island there had been a major engineering disaster in Bopal, India, where valve leaks had released toxic gases at the local transfer station of a processing facility that killed thousands. Its cause was chalked up as "human factors," a loose term that pointed the finger at inadequate training support for the system's design and subsequent maintenance procedures. For this reason, even though 3-Mile Island had frozen the development budgets in the nuclear industry, *training* was considered sacrosanct, under tight scrutiny of the U.S. Government Nuclear Regulatory Commission. Training could not be frozen.

Trying to make the most of our position within the office's tightened staff development budget, I sought the best way to argue for funds. I would create a set of measurement standards that allowed anyone to establish the return-on-investment, or ROI, of any training dollars spent. I obtained the U.S. Airforce Training Manual and proceeded to extract the arguments and standards by which we could measure efficacy in technical knowledge. Now, instead of higher-ups using these funds for junkets to their favorite professional society meetings in Miami and Las Vegas, we could demonstrate a higher return-on-investment by sending individuals to specific conferences to bring back knowledge on equipment and technology to the entire team, spreading the use of limited funds into measurable staff training. This entailed proof that those individuals who *got their junkets* to Seattle or Detroit or Tulsa could pass along the knowledge and skills they'd picked up.

My task was to demonstrate that I could *train* engineers and designers to train others…thus multiplying the return on any investment logorithmically across the organization and into savings in client projects. And it was in attempting to do this that I uncovered a Gestalt problem that doomed me to failure, and seemed to be generalizable to any aspect of learning—not precisely how learning takes place, but the context for learning something, in the perception of the "shape" of what is to be learned.

Learning Drag--defined

The concept of learning drag can be generalized to include any incorrect application of paradigms. A paradigm is a model being used to measure ideas. It might also be compared to a mold into which all thinking gets poured into, so that all conclusions will fit the contours of the paradigm. Learning *drag* is merely a metaphor related to *friction* that slows or impedes behavioral change.

Education as a Training hybrid

When people look at the topic of learning, it is just like a figure/ground problem—they see it from either the perspective of the learner or the *reason* for the learning, but never both. And this is the core difference between education and training.

Training takes place in the military, where the results of every hour in training must be measurable in terms of programmed behaviors in soldiers, sailors, airmen, or marines. Training also takes place in music schools, gyms, kennels, zoos, circuses and aquariums. The purpose of training is to create behavior

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creates a new area of complexity in the General Theory of Relativity…which opened up many new distinctions in the idea of space and the behavior of energy and matter in fields, that new ways of measurement led quickly to the discovery of new particles, whose explanation opened up the Pandora's box of complexity in Quantum Mechanics.

protocols, automatically programming trainees to narrow the options for anomolies when a high level of coordination and co-operation is the goal.

Typically, to explain the difference between training and education, I would explain that in training it is the responsibility of the system to ensure that every member of the training group or set is equally calibrated to a certain standard of performance. If this calibration isn't achieved the *system fails*. In education, on the other hand, it is the individual's responsibility to succeed or fail. Success moves students up through the promotional maze of their choice, while failure weeds out one path at a time. Education is oriented to the person, considered for the person's benefit—but an education *system* is already become a mixed metaphor, for the system is created for the benefit of society, to build a citizenry that can work together as a functioning economy and a safe state. So in this sense, too, the state fails if the educational system fails. Thus, educational systems are a hybrid, leaving it up to individual to identify with different aspects of the social system, and succeed where they can, and allowing the social system to weed out and sort individuals by their skills, knowledge, and motivation.

And here was the problem that I've alluded to. No matter how many times the differences between training and education were explained, and no matter how carefully I built my in-class exercises in designing measurable training objectives and delivery scripts, as soon as these had to be integrated the final presentation by the Lead Engineers and designers chosen by their departments as trainers, every one recreated some version of their old algebra teacher! While they attacked the problem of training design seriously, they always reproduced performances from their appreciation of "education" in school.

But my workshop had demonstrated each of the participants had grasped each of the component training techniques I was passing along—they could successfully demonstrate translating technical knowledge into procedures and thence to job aids, none of this could be tied to their fixated model of the schoolroom. When it came to their final demonstration exercise—everyone did the same talking head slideshow (accompanied by hardware hands-on or detailed blackboard demonstration) after which they passed out the job aids they'd so dutifully constructed through the workshop!

The answer was simple. Change the model of "the classroom" to that of an engineering and design meeting with their departmental staff. The meeting's objectives were to introduce a new technology or engineering resource, and the meeting's goals were to mitigate incorrect specifications and otherwise costly workarounds.

The next (and last) time I gave the class, my changes worked. I dropped the word 'training' entirely. The "train the trainers' class became a training session for "technology transfer meetings." The simple answer was that the workshop had been inappropriately named! The "meeting's" objective was to take knowledge and 'skills' of outside specialists (new technical discrimination skills) and disseminate these to the project teams from our office.

The first group had misinterpreted the new technical discriminations as *knowledge,* with their role *as teachers*—rather than seeing the discriminations as *processes that could be tested by proper implimentation of a protocol.* For my part, I'd learned that the transfer of *my own training technology* had to be carried out in the same fashion. The lead-up to my workshop had to be couched as a technology transfer meeting, demonstrating how to substitute *human behavioral* risks for *engineering* risks, and design and introduce all the protocols (procedures and job aids) that would mitigate system failures.

The second group was shown how new technologies could be broken into engineering tasks, types of discriminations and available choice options that could be immediately applied to the company's line of work. I used the very same exercises as with the first group, essentially doing the analysis for rough procedures that could be turned into job aids. But when the technology transfer was designed as a meeting rather than a class, it centered on the job aids and making sure everyone understood how to use them. Verification in the *use of the new skill* would take place in the questions that came up throughout the meeting as members of the group brought specific examples to the table to make sure they understood what they were doing with the job aids. There was no way confuse an engineering meeting with an algebra class…if algebra had to be "taught" it was done as in a military briefing, with everyone's job-aid in hand. The education had been proceduralized into the job-aid, and the meeting was to make sure everyone could go out in the field and use it properly.

From learning drag to bad analogies

But in generalizing the problem further, to turn "learning drag" into a standard for training systems design was another problem altogether. I may have simply run across a very open-and-closed case for a Gestalt (though I didn't recognize this relationship at the time). There was nothing specifically in the literature about it, and upon calling the editor of the profession's major journal, I was immediately shunted to a major military base and from there up to the Pentagon. Sitting down with the Director of the Army's Training and Indoctrination Command I was able to establish the key issue, which was one I was intimately familiar with. For while I had not taken my job in the typing pool with the purpose of becoming a training specialist, I had spent my graduate school work in Anthropology studying respect codes, with a particular emphasis on how behavior maps were constructed. Much of this centered on patterning and mimicry. At the center of the problem was another, called "what makes analogies work?" Or, "when do metaphors fail, and how do we know it?"

The problem of analogies has long proven intractable. It is no small problem, for it lies at the center of induction…one finds it in formal arguments over the nature of mathematical logic. The other simple problem which my example of learning drag demonstrated is that if an obvious cause could be isolated and tested, the drag might be easily (i.e. trivially) mitigated by substituting another term with more appropriate functional values. But in this case, it also turns around a rather complicated issue— because the meanings which individuals attribute to the words they use are eventually ideosyncratic to those individuals.[78]

Can we discern a summary for discernment?

The question of discernment is as old as philosophy itself. This chapter has jumped over a number of disparate approaches to the problem, which I called "paradigms." We began by placing James in the context of a young intellectual who considers himself primarily as an artist, yet raised in the context of growing science in Europe. When he realizes he doesn't have what it takes to be truly great in that sphere, his backup is to science. As his 'sabbatical break' before settling down to his new career, he works under Louis Agassiz attempting to classify the incredible types of nature found in the Amazon. He returns to make a philosophical contribution, presciently entitled: "The Perception of Reality" in which we find the first statement and key problem to dog him throughout his academic career, his pluralism.

Our goal is to tie down what he eventually makes into a criterion for judging the adequacy or 'fitness' of a philosophical system with the ultimate reality of nature…a reality which he has already accepted as a partial representation. What, inded, could 'thickness' have to do with James' discernment of truth?

Beginning with the arts, then, we see what anyone might have first expected about any attempts at representing the 'truth' of reality in Leonardo's advice to young artists. How to begin differentiating noses, brows, and eye structures by creating little visual tables, i.e. job aids, to memory and representation. Everyone, we would think, can identify a nose for a nose. Von Ehrenfels and Kohler wouldn't hesitate to tell us how we must do it —but Leonardo indicates how many different possibilities there are, and that we must learn to differentiate all the constituent shapes that separate human noses. Indeed, some may differ little from a dog's snout. He tells us to observe stances and their relationships to emotions, and the placement of weight depending on the motion and attention we want to represent in our subject; those who see our paintings know very well what is natural and what is an unnatural and forced.

Ruskin, too, is quite specific in this attention to details—to the lay of the rocks, the reflection of light and representation of shadows; the way that trees are to be painted must be consistent with how trees and leaves grow. Yet Ruskin has provided an additional criteria to the "truth" of a representation. It is, in fact, tied to the issue of color perspective that I discovered with my mural—that the *knowledge of color discriminations* which Sir Joshua Reynolds assumes all his graduates to have is not to be over-accentuated. What I had discovered, quite by accident, was my physiological discernment of *space* was somehow tied to my ability to differentiate colors—that my vision was used to creating glosses, quite like the fuzziness

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[78] The upshot of my story about the discovery of learning drag is that while I could lay out several potential avenues for research into its validity and usefulness as a training concept, and while the Pentagon was very willing to entertain my proposal, my engineering employers were not especially interested in keeping me on-board for a research project outside of engineering. And as I was soon to discover, there were other important fish to fry….like the cataloging of field engineering work on video, which leads to the grammar of work in Volume 2.

that Kohler describes in his example of the grasp of *turgidness* in the soap solution—which, if looked at through a small visual frame showed different constituent colors. What I discovered is that the trained arts turn this frame on and off at will, with choices as to how much or how little to represent. These were quite like what DaVinci describes as quite obvious options which a painter has in representing distance, and the intervening atmosphere that softens color.

All that remains to this particular summary, for it is only the summary of a chapter and not of the entire problem of discernment, is to bring the idea of 'paradigms' itself into focus. "Learning drag" is not a commonly-used terminology, if its use is even justified at all. How it is tied in, however, is through the discovery by the Gestalt school, that the context of a shape—to be discerned—must be included the constituents of the shape itself. That the melody will be recognized in isolation, but that with a slight shift in context it may be obscured—that it only takes a slight modification in the tune's environment to suddenly jump out as the central figure. This, is very much the case of what overcame my own perception of color and space when I suddenly walked out of a two-dimensional framework and was enveloped in a blooming three-dimensional world of a living city, of space and air and colors that overwhelmed me. Putting them back into a two-dimensional mold, I force-fitted a paradigm. It worked, but in an unexpected way, and displayed a version of reality I was unaccustomed to.

The artist represents the individual whose intentions are to harness complexity and put it to work. We are at a mid-point in a discernment of this representation.

6. Density

Nelson Goodman—Art as Symbol and Sign

The subtitle of Nelson Goodman's *Languages of Art,*(1968, Bobbs-Merrill) is *An Approach to a Theory of Symbols,* so if you pick up the book wanting to find out about art you will be mistaken. Yet, as it turns out, he provides us a very instructive theory of art, anyway—even if it is "only" a symbol system. For what he essentially gives us is a very high-level (i.e. deep-structure) interpretation of art as existing at the *working edge* of chaos. To suggest that "the languages of art" are, like spoken languages, simply symbols comprised of components (whether these are sound components of words, visual representations of sound-words or picture representations of sound words that might have different sounds in different dialect) seems extremely academic and reductionist to artists, like myself, who wish to perceive things holistically—but it is presented as an hypothesis, rather like "if we posit art as another form of symbolic communication, which from a distance it certainly appears to be, what could the components be, and what would that tell us about symbols?"

So, in fact, he is not *reducing* art to symbols, but *raising it* as a higher generalization of what symbol systems are trying to accomplish, all alone and by themselves. Thus, Goodman is taking language itself to be art and all of communication as an *art-form.*[79]

The bulk of Goodman's book is devoted to an analysis of notational systems—how are they derived and what makes them work; also, what makes them different from *maps*. From this standpoint, he takes a close look at what *fidelity* and *validity* mean—for example if one is presented with a fraudulant Rembrandt, or a verbatum but *'dry'* performance of music versus one with expressive *aesthetic execution.* In music he notes that the artistry of the performer/interpreter can both amplify or entirely lose the art of the composition.

Surprisingly, he is able to take this discussion to a conclusion: that art *provides us no different a representational structure than scientific languages*. His rather heretical conclusion is that one can either raise artistic speech to the level of scientific speech or reduce science to an artform! At the center of this analysis is his critical—that *whatever approach you take for the analysis* of symbol systems you are forced to consider the relative *density of symbols* versus *differentiability* (i.e. potential digitizationyou're your representational media—e.g. the *sensory language* through which the art 1. produces its creative activity, 2. through which it is appreciated, and 3. may be re-presentable.

Goodman recognizes his use of *dense* does not exactly conform to the standard usage--

> "Since the misleading traditional terms "analog" and "digital" are unlikely to be discarded,
> perhaps the best course is to try to dissociate them from analogy and digits and a good deal of

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loose talk, and distinguish them in terms of density and differentiation—though these are not opposites."

The continuation of this quote which explains his use of *dense* by differentiating analog from digital is itself incredibly dense, difficult reading which can be left to a footnote.[80] But our concern with Goodman is that he provides us an independent consideration of the world of art. Our question up to this point was given to *discernment,* of differentiability. Goodman turns this upside-down for us, and provides a new term for the *non-differentiable*—i.e. dense. Not only this, he does this as an outright strategic move to escape the 'misleading and traditional terms' of *analog* and *digital* that relate our discussion to the mapping systems for computer technology. Moving to this transaltion, the *analog realm of symbols* will be covered by the term *density,* while the digital realm of symbols are strictly differentiable.

Goodman gives us a more scientifically acceptable handle on which to hang James' term "*thick,"* which relates to a philosophy as a symbol system, e.g. a work of artistic representation (which may be considered continuous with scientific representation) in its clarification of *dense* versus *differentiable* notations.

Goodman's application of the term *density* to art, and the problems of notational differentiation refers to the simple logical density of a distribution, where you may always theoretically provide a mid-point between any two points, however close. Goodman's use of the term is not in the dictionary.

James' *thick* was too crude and metaphoric to ever gain any traction in scientific circles, but here we'd seem to have a more acceptable alternative. Lexical research tells us that *density,* in its earliest usage included the idea of "thickness," presumably in the sense of closely packed laminations or layers of some substance. A tightly packed undergrowth (a "thicket") still retaining the idea of a measurable "density" of distribution with the addition of a sense of heterogeneity and complexity—something that was difficult to work your way through: density is *like a thicket.*

So we have essentially stayed on good terms with our terms…and merely need to amplify the objectives of Goodman's *density* to include James' objectives. But not only that, Goodman's conclusions regarding the grosser connection to an "analog/digital" relationship, with the overall connection to symbols used in communication, putting art and aesthetics within the even larger envelope of information (systems) theory provides a new and vital turn to our discussion.

Goodman just doesn't press the issue further, having established his points regarding symbol systems as languages –scientific or artistic, formalized or not. What he does not address is the assumed *role* of art: what artists *do* is at the interface of the chaotic…in a realm of undetermined relata… through the artist's interpretive skills, making that chaos *gel* into structures that "can do work." How they do what they do is with what Goodman considers 'symbols,' and he's shown what constitutes such symbols.

Goodman considers the issue of aesthetics from the standpoint of correct vs incorrect mappings, for example, copies of a Rembrandt that do as much (or more) for the viewer as the original, yet he simply takes it for granted that art is aimed at doing emotional work which is valuable as engineering and science in its own right.

Again—we don't really satisfy any curiosity we may have about justifying the world of art. This is a non-issue for him (to have to stoop to find a justification, as if only a cretin would consider the thought that art and emotion have less value than science and hard facts). He has levelled the field between art and science by means of symbol systems and the philosophy of mapping. This is clear enough proof of your case. His focus is not with the *value or meaning* of the art, but with the distinctions between art and not-art

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[80] "A symbol *scheme* is analog if syntactically and semantically dense. Analog systems are thus both syntactically and semantically undifferentiated in the extreme: for every character there are infinitely many others such that for some mark, we cannot possibly determine that the mark does not belong to all, and such that for some object we cannot possibly determine that the object does not comply with all. A system of this kind is obviously he very antithesis of a notational system. But density, while it implies, is not implied by complete lack of differentiation; and a system is analog only if dense.

"A digital scheme, in contrast is discontinuous throughout; and in a digital system the characters of such a scheme are one-one correlated with compliance-classes of a similarly discontinuous set. But discontinuity, though implied by, does not imply differentiation; for as we have seen, a system with only two characters may be syntactically and semantically undifferentiated throughout. To be digital a system must be not merely discontinuous but *differentiated* throughout, syntactically and semantically. If, as we assume for systems now under discussion, it is also unambiguous and syntactically and semantically disjoint, it will therefore be notational." (ibid;. p.160-61)

in some presentational media. The production of good art is not at issue. However, the production of bad science is.

Goodman eschews the problem of aesthetic taste, of taste-less art, of the engineering construction of an artistic system that, for example, provides no pleasure. Making no distinction between 'good and bad art' is understandably correct—there are no no generally applicable measurable qualities that can be assigned to taste, although various tastes (such as those of perfumes or wines) can be highly calibrated to particular known standards. Yet there are no calibrations for the human instrument to say something is 'tasteful.' Is what John Cage does, art? Is what Cristo does, art? The same was said of Turner and Van Gogh by quite fixed conceptions of 'the tasteful.' Are truffles and caviar and saffron worth their weight in gold? A taste for the subtle aroma of myrhh, once the monopoly export of a small province in Arabia, was the sole source of wealth underlying an entire kingdom—when the taste died out, the culture and its people vanished from history. Taste and aesthetics are not ephemeral. They matter, but we are in no position to try tying them down.

There are a plethora of problems associated with interpretation of meaning that are continuous with the recognition or defining of taste. These are two simple perspectives on the issue of sorting. Goodman, however, has pointed the way to solving one horn of the dilemma, which is that we shall need one or more criteria of density to discuss various realms of art. So after looking closer at the term 'density' we shall investigate indexing structures.

James' *Thick vs* Goodman's *Dense*

The problem of the artist is the *gel* at the interface with reality, with the chaos of the senses. James knew this when he decided that all the representational skill in the world wouldn't save him from being a *poor* artist, a craftsman with no vision. At the time he was studying art, a contemporary of Winslow Homer, Thomas Eakins, John Singer Sargeant, James Whistler, and following an intensely Romantic representative story-tellers such as Jacques Louis David and Ingres, the challenge of impressionism (and logically, even further abstraction) was already in the air.[81] Ruskin trumpeted that challenge continually over the last half of the nineteenth century. The entire question—and value—of art is that it lies at the interface between the rational and the sensory systems. Ruskin's oratory was that this interface was also *spiritual—that the cusp on which aesthetics sat one could find the Sublime.*

Goodman's focus on art as symbol misses the distinction between percept and concept, that the *percept* is something beyond the interface *that is gel'ing*. The percept merely is a proto-concept which must be symbolized in some fashion….yet for him the question is 'what makes a functional symbol?' This is not irrelevant to James—it is part and parcel of the philosophy of Pragmatism. But there is more to it, and this may be why James decided Radical Empiricism must supercede Pragmatism.

The question is not specifically with the symbol but with the act of symbolizing, of drawing out the concept from the percept, and of connecting MY-PERCEPT-RECOGNIZING-SYSTEM with YOUR-PERCEPT-RECOGNIZING SYSTEM, perhaps giving you a new way to recognize things, to 'make things gel' and have meaning, e.g. *a taste.* This is essentially what Ruskin claimed as the purpose of the artist—to see what others could not yet see, and make it tangible. The artist saw something new and was a creator-of-visual-and-emotional-paradigms.

The problems Goodman is working out in the late 1950's and early 60's are at the cusp of a watershed change in the paradigm of science. Shannon's information theory had just begun driving engineering and technology. In academia, the philosophical importance of symbols, as pure phenomena, as THINGS-IN-THEMSELVES , had become apparent. Ernst Cassirer's three volume *Philosophy of Symbolic Form* appeared in 1957. Thomas Sebeok's Semiotics (the science of signs) was just coming into being, looking at the mathematics and "Pragmatic Humanism" of Charles Saunders Pierce for its origins. It is not surprising that an entirely different angle was taken by Marshall McLuhan, who redrew the boundaries of *human* communications theory inside the map of human purposes—turning the communication medium

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[81] Kurt Vonnegut's novel *Bluebeard's Castle* is built around the premise of an artist who'd worshiped representative art but realized he could never be an artist until he proved he could create canvases of emotion without representation. He becomes rich and famous inventing 'anti-art' with the Jackson Pollacks and Kandinskys of his day, hiding a masterpiece he's worked at his whole life but considers non-art. All along he was the world's greatest painter of photographic trompe-d'oeils.

into the dominant cultural artifact of human societies, where cultural artifacts have to do with *taste*, and where our technos or technê is the extension of ourselves into our context, or living environment.

If 'thick' is to be applied to one's symbolic methodology (in the case of James' criterion of adequacy, to one's philosophy) it's not surprising that James' description of Fechner's "thick" philosophy might conclude with the statement that his colleague Josiah Royce's philosophy has the very same holistic vision, but it is unfortunately a "thin" philosophy. As a criterion of adequacy, 'thick' is not about good or bad, right or wrong, nor about 'fittedness.' Royce's philosophy *represents the same world vision as Fechner's,* but while it is logical and intellectual it is essentially 'tasteless'—except to those intellects with highly-developed sniffers. Fechner's is "thick" because it is full of flavor that the smallest child can taste, turning it over on their tongue as they explore a new world, savouring it with each and every thing they encounter.

Goodman's *density* hardly takes on this much scope in regards to a symbol system. Art is a realm of symbolic representation using symbol systems that are non-digital, and imply an analog frame. Perhaps that is all that we have. James' *thickness* is in reference to an artistic framework of representation, specifically a language to be used in the representation of reality—e.g. a philosophy. As such, it should be a symbolic framework that is useful to scientific representation. To the extent that it is *artful* and thereby *thick,* it should be sufficiently analog and *dense* to allow easy hooks, or access points, to the world of experience. Its *thin'ness* can be judged by the necessity of grasping its proper understanding and use only through one-to-one correspondances, i.e. *digital representations that satisfy discrete verification criteria.*[82]

Density's many Meanings

This book began as an essay on density.

Goodman's discussion of art actually brings us to the very beginnings of this particular book. It began with this chapter before it had anything to do with William James, though I had already worked out quite a bit of theory around James, but not having realized exactly why it always returned to him. As mentioned, my actual place of work was in the training side of engineering, which brought me to the side of cutting edge technology. For our company's other divisions, in other locations, were involved in the applications' phase of new developments, and under the rubric of "technology transfer" I could get support for my own theoretical applications work in the toggled theories of knowledge representation, communications, and learning.

In my particular business, a fellow named Scott Perry from the Harvard/MIT corridor, and later out of Princeton, had been pushing a training model known as KAS, or Knowledge Attitude Skills—that there could be no successful training transfer of a set of behaviors without a balanced engagement of all three legs of the KAS triangle. The central leg, as you will notice, is actually *attitude;* and there are no two ways about this being about emotion. My own work with emotional representation had begun in undergraduate Cultural Anthropology, when I opted for my graduate school focus on respect codes, knowing full well the importance of publishing early or perishing before one's scholarly puberty. I was doing my Masters thesis on Central Asian nomad respect codes when I took the typing job in the Philosophy Department at the University of Pennsylvania, and thence introduced to William James as the best place to jump into a general study of psychology. And besides getting an insider's introduction to all the classics, because of some hunches I was developing around the relationships of respect, laughter, and the emotions, was directed specifically to the works of Charles Saunders Peirce and Karl Popper. For anyone who is an academic insider in the world of philosophy, these names should bring up associations to the study of statistics and randomness, as well as a general analytical orientation to structure. So when I didn't publish, and found myself exercising my college typing skills in an engineering corporation, eventually finding my way into the training department, it is only natural that my work with KAS would find its way back to the Harvard/MIT corridor of William James, a close collaborator of Peirce's.

Returning to the origins of this book, however, I had meant to finally get around to publishing my hunches around the relationships of respect, laughter, and the emotions, just half a century later. I determined that the opening salvo was to develop the term *density* as a way to explain what the emotions seemed to be doing in terms of the disambiguation of events. The general structural argument relied on

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[82] Or many-to-one, as long as there is a discrete lookup available for the many.

the role which *linear thought* plays in our understanding of an otherwise chaotic world. The picture I had mentally arrived at was very loosely like squishing an entire picture down into a single raster line and finding, not chaos, but an extremely dense configuration that, were you to have the right rules, you could expand back out to the entire screen. However, it might also just be that everyone squished their line to a different angle—all arriving at a similar line that could be rotated and stretched match the line of anyone else, all of which expanded to the same picture. However, the layering of pixels at any given location on the line would be very different from one to another, depending on the angle—and this might correspond to different understandings of how things got to be the way they were on that line.

To extend the analogy isn't worthwhile, for to make it fit experience we have to start rotating and bending the line, and postulating projections, etcetera. I suggested it merely to make a point about 'density.' For as I wrote the following piece on *density,* I slowly realized I needed to deal with the concept of 'chaos.' It was also becoming more apparent, that the term *density* itself, was highly ambiguous, though it masqueraded as very technical and precise terminology.

Having more than a passing familiarity with James' blooming and buzzing perspective, I was rereading him for some insights when I happened on Jacques Barzun's book, and his final one-word summary of his philosophy as *thick.* And you know the rest…. bringing us back to the beginnings of this book; and thus,

The disambiguation of Destiny,.,,.. no, Density!

Common understandings of the term *density* generally refers to a state of compactness. The term is used as a reference to a *measure* of compactness, such as the distribution of a population of something in a given area or volume. In terms of physical mass, its use is expanded to refer to the relative heaviness of objects. In Computer Science it relates to the amount of data fitting onto a storage medium. It also refers to visual opacity, the lack of transparency or clarity, which metaphorically may extend to its other everyday use, as a term referring to someone's being obtuse, slow-witted, or stupid. The term extends to different forms of relative measurement in science, describing a Q(uantity) per C(ontext).

The term's origin is Latin, where our English dictionary provides the reference to *thickness*. Yet the Latin referred not to *any* thickness (such as a thick tree or a thick neck) but rather to things being tightly-packed. This would include thin things tightly-packed to become thick—if wound together as threads, or laminations of paper, cloth or gold foil, and perhaps even fishing nets…which comes closer to a modern metaphor for intersecting "world-webs" on the internet—what modern influence companies have learned to phish.

The story of that highly-coordinated concert, and the ghastly sound it produced, suggests another understanding of density—and all the ways in which the overlay of frequencies might be perceived, as "white-noise" perhaps, or cacophony.[83]

The expanded use of the term which I would like to introduce, in light of Goodman's usage and our attempts to find a better definition for 'thickness,' *density* will refer to the simultaneity of contexts and their potential intersections and impacts on one another. What we want is a way to discuss the redundancy of connections or functional interfaces that may or may not be between things of the same kind, but which contribute to a larger system.

From linear density to interconnectness

Consider the interconnected threads of a television serial, where we follow characters who appear and reappear in various stories and whose lives become incredibly, dynamically enmeshed. The typical denouement (which is the 'un-knotting') takes place when multiple stories come together, getting the heroes out of a pinch.

A television serial is the linear characterization of an interconnectedness of reality. It is constructed in what Erving Goffman calls 'frames,' which he compares to theatrical scenes, roughly describing the way we tend to organize reality and present ourselves within it—in a sense quite like James' multiple belief sets.

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[83] There is a very interesting section, since deleted from my trash bin, that brainstormed all the ways one might generate sound cacophonies of instruments playing on top of one another. I recommend it as a worthwhile mental exercise to carry out when caught in a traffic jam.

We can relate to a sitcom, and to soap opera stories because they imitate a small town society, where everyone's stories from decades and even generations back are still an integral part of the ebb and flow of today. There is, in the reality of that small town—analogous to the threads of the television serial—a kind of balancing act, reflecting the personal forces that hold things together, superimposed over the flows of goods and information in a business. The sitcom and soap opera, however, present a thin gloss of the surface…for a half-dozen threads can hardly get down to the richness of social life of a couple thousand people. And of course, this is just for a very small town.

But notice, to speak of the density of inter-connectedness in the threads of personal stories, we are hardly speaking of *density* in the same way as one considers populations of swallows in the old school roof. This gets much closer to the near-chaotic dynamics of an ecology, in which the density of swallows is dependent on the density of flies, which is dependent on the density of flowers or compost, as well as prevailing winds, and nest material, etcetera, etc. And even this is only a single inter-dependent hierarchy among thousands, if not millions of possible hierarchies in a small closed ecology.

This, by the way, is *not* Goodman's sense of 'density' either, but I will suggest this as our first perspective on *thickness*. In Goodman's case, the artist is attempting to take a Gestalt –to capture a particular meaning of the whole, through a particular lens, and glimpses of pieces of various threads and the hierarchies they entail, as overtones—noting harmonies and dissonances and very rough shapes, perhaps highly polished into a stylized ideal or caricature. The particular artform provides the artist with a *dense* sign and symbol system that we would assume 'is capable of capturing thickness in its means of representation,' which are the artistic conventions with familiar connotations to viewers. Goodman's density is 'analog' that, like an analog computer, measures curves and surfaces directly and converts them to curves and frequencies—like the grooves on a record provide an analog conversion of acoustics. This is Goodman's density.

I am trying to get at its possible *structure*. Having used the term 'thread' for the sitcom, let's look at a fabric composed of several hundred colored threads. One might consider the complexity of a design over a continuous surface as a function of their density. For a woven fabric the colored threads are continuous and a particular color may only appear sparsely in the design. In this analogy, the complexity of the design is the pre-planned or programmed "coming together," but the weaving on the industrial Jacquard loom, is a complex process of criss-crossing and weaving together.

When one speaks of the undergrowth of a forest as *dense* it is often with respect to its resistance to being cut through, or easily unraveled. Yet here, too, we might speak of density as a measure of redundancy built into the connections which allow everything to thrive so closely, and simultaneously. We expect such an approach to analyzing the 'weaving together' of ecologies. The density is generally not fully understood. But let's say that a certain berry is 1% of the diet of a key player in the food-chain, but without this berry in their diet they are prone to a particular disease. Now someone could say that the ecology requires a density of two bushes per acre to meet the needs of that population—indeed, we are still using the term *density* to cover distribution, but one could hardly consider this a *dense* population of our bush. To speak of *density* in this case, we might consider the bush to be part of a very *densely-knit* ecology, where the entire system is dependent on the loss of a bush or two.

In the case of the television serial one might break it down to a reasonable network diagram, where each connection between any two characters might have a dozen or more possible attributes— jealousies that touch third parties, resentment triggers, old romantic entanglement, etc. and we could assign a color code to the tpes of relations between players, showing the connection. A small "close-knit" town is probably beyond such network diagram, even beyond a wetlands ecology because of historical ties that bridge multiple generations in odd and unexpected ways. The *density* in this case is no respecter of time—the propensity for a flare-up between disengaged networks remains as long as a memory of family histories is still alive in the town.

Organized Density – Corporate manufacturing

Unlike the multiple realities that represent a small town, the business model for a factory Management Information System (MIS) is quite do-able. This is still *dense,* for a complete model will drill down to the lowest levels of equipment production and maintenance schedules, in which every

function has multiple impacts on different people and their work in entirely different representations of the enterprise.

I was once employed in designing and testing MIS installations. Such a system (though purchased in packages) is never designed to cover everything for a unique installation. That is what an analyst is hired to do, and why outsiders are generally given the task for large corporate settings. The analyst is *supposed* to see things as an outsider who must attempt to lay out the weave of functional networks from scratch, with no preconceptions as to how things work…..that is, misconceptions about the weave based on a close familiarity with the final designs showing on the surface. Many unrecognized plant harmonics come to light, some of which may reveal unexpected holes, or efficiencies in regulating systems. For example, one person who has always done something diligently…who was trained by the person who did it before procedures were ever written. Now, it turns out that what they do has never been completely documented in a procedure… and while it is critical to the shape of things, perhaps for someone's job-security it has remained *transparent* to the system representation. For all intents and purposes in describing the surface design, that thread just isn't there. And yet, we all know what can happen if you take the thread out. The entire fabric loosens up and starts unhitching at the seams.

Business analysts were always on the lookout for similar features as companies began computerizing everything. Computerization took the place of old-time procedures, concretizing the processes so that, quite often, things couldn't be adjusted at the surface any longer, because no button or code existed for that adjustment. Formalizations sometimes destroy unrecognized efficiencies. But the real question is, how can they go unrecognized, and what does it take to uncover them before some disintegrative melt-down occurs? [84]

This is the notion of a dynamic complexity that the ecologist is after as well. Again, it is not the density of distribution, nor does it immediately relate to probabilities—which is a major function to which most density measures are put. Quantitative characteristics are certainly going to play a part in any description of a large interactive field or system. But we are no longer looking at the density of knots in the rug, but we are *possibly* looking at the population of dandelions in homes around the golf course. Yet is there any type of analysis to let us know that we've covered all our bets?

It returns us to the characteristic plot structure of Dickens or Hugo's *Les Miserables,* where a minor character from the first chapter saves the day in the twelfth. And for those who ask for an ecologist's deposition at the hearing before highway construction begins, there can never be a science providing absolute surety that the situation has been cleared of all potential impacting factors. Just as there probably is no way to know (*even* if you are the author) if a bystander may turn up who actually observed the accident scene, or a video camera that recorded it in the distance, that changes the outcome of your case, or the denouement of your story.

Von Ehrenfels *potential.*

Christian von Ehrenfels bequeathed a prolific school of thought, although he pushed the idea of Gestalt too far for *his own* credit. But he left society richer, and it seemed he could use something, in English, to perpetuate his memory.

We are looking for those critical pieces in a complex situation that, almost by definition, are *transparent.* Missing or hidden connections that could make a difference if we knew they were there. I will call these components having 'VonEhrenfels potential.' The tie to VonEhrenfels is that they are a demonstration of the previous assertion that *there might always be something else in the "whole" that makes the Gestalt whole what it is.*

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[84] My favorite story is when I was writing training procedures for a large factory manufacturing precision surgical equipment. One cutting/milling machine was half a block long, and required several hours of time between runs to change out half a dozen cutting dies for a new-sized product. The machine controls didn't reflect this process, as the operators simply shut the machine off during change-outs. Unfortunately, the Management Information System had been direct wired to the machine, and had no automated codes programmed into the system to let the operators log why the machine was off. And the operators logged themselves off the system as "time off" whenever the machine was logged off, assuming everyone else knew that the dies for the central machine in the process had to be changed out at every run. Unfortunately, upper management didn't make the connection, and constantly gave that department and its employees bad performance marks for production rates….explaining why no one had gotten a raise since the MIS was installed. This is obviously a story from the early days of computerization— Such things could never happen today when we're protected by redundancy, i.e. statistical overlaps, since there are even more computers to make sure everyone does their job correctly. For you see, it was because I was hired to create a computerized training system that the glitch was caught early, just sixteen months into the mistake!

This is to say, the idea behind Gestalt analysis is that it is not simply a sum of components that make up the whole, but their characteristic arrangement …which may include the dynamic structures and artifacts of their interactions. All that is well and good…there is quite enough to study even when we have all the components of some thinga-ma-system in front of us. There are n-factorial permutations of interactions, which gets pretty large, but for a programmer paid hourly, the more the better—all of them can be listed and entered into his totally complete and digitized system-ma-thing.

What the Gestalt school came to realize, however, was that the *context* of your system-ma-thing was an important part of defining the thinga-ma-system in the first place. Depending on how you looked at it—in context--the components rearranged themselves! This was the familiar figure/ground picture that switched figures on your vision. Now this is *still* alright with your programmer, for he or she can start listing shuffling rules to the component interactions…This is, after all, just an extension of normal processing rules…it simply implies a new set of system-ma-thing boundary operations. For the business enterprise, unlike the ecology, our system-ma-thing is *defined as having a fixed purpose…it is essentially a 'closed' system.* The ecology is only as "closed" as we set our analytical sights, and the breadth of statistics we choose to collect. [85]

What I will hypothecally postulate as components with 'vonEhrenfels potential' (e.g. vonEhrenfels components) are those pieces which are part of the internal workings of the system (our assumed 'system-ma-thing'), that have enough independence as 'things in themselves' to have relationships *outside of the system.* Thus, to the extent that a system has vonEhrenfels components it cannot be closed—its full definition must always leave it a 'thinga-ma-system.'

Where this postulate would seem to fail is with its logical extension. Von Ehrenfels, pressing his logic to its limits, would probably contend that no systems can be fully defined, since every independent component is only independent and distinct through its share of his quality, the von Ehrenfels QUALITY, which he eventually claimed for practically everything. I would actually tend to agree with him here, but it is almost like turning the Gestalt idea upside-down, saying no component can be defined solely as derivative of the system it belongs to!

From this ideally logical perspective, the level of independence of the component from the system will be a matter of degree—and that degree is transparent to us. It only becomes apparent in extreme cases.

Obviously, we are more than the sum of our parts, but anyone will contend that the part, like a heart, belongs in the system where it is!

Yet in the new biological world of knowledge has opened up protein generation to us; the heart and the bone and the tissue are all systems-unto-themselves—speaking of definitions that evolved or were created in the snap-of-an-eonic-finger through the creative flux of speciation. Each can be transplanted, perhaps with difficulty…but ever moreso with the growing understanding of where they came from and what makes them work as good members of the system, The micro-organisms that aid in our human digestion belong to a different world altogether, a world unfortunately they share with bacteria that get into us and eat the wrong things….to be selectively eliminated with greater and greater skill as we determine *all their etiological underpinnings.*

The concept of the *vonEhrenfels potential* has been introduced. It is simply a convenient way of speaking of potential reach of a component's definition and its governing principles set *outside the boundaries of the system it is a part of.* I shall provide some familiar examples.

Considering boundaries in business

In a factory, functional interfaces to the external context are clearly all the economic and physical transactions with the outside—purchases of raw materials to sales of goods, hiring and pay of workers, etc. can be clearly documented. Or so one would assume. Non-functional interfaces that have a bearing on the plant may be the many personal connections of the owners through family, clubs, churches, which may

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[85] The ecologist knows there is a limit to the budget of their time, and the lifetime (i.e. purposes) of their work. They may be relativists with respect to life on this planet, where human purposes are secondary to protecting a particular conifer and all the species that make it home….but their ruling argument is that biodiversity *is the rule of our home.* Needless to say, there is still a limit to the statistics they will collect to make that argument.

turn out to be the main source of business. This type of contextual role in the enterprise's behavior is just below the surface, and fairly evident; it does not add to much interconnective redundancy. However such connections represent a type of *density.* It may result in swinging orders for raw materials and services from friends and family. It may turn out that there has been a subsidiary market taking place at the loading dock that has resulted in preferential treatment from truckers. Marketing and sales may rely on sexual relationships that have no place in business whatsoever.[86]

But let's look at density inside the plant operations, in another type of "business system," which is slightly less 'closed.' A hospital can be considered a social machine—a densely interconnected system demanding high interactive efficiencies of its many-tiered staff, with an added factor of being a microcosm of the local community, since a hospital is often the major neighborhood employer. Perhaps more than in any other work environment, a hospital demands a wide distribution of support personnel across its floors. Without knowing how this "fabric" might be represented, and caring little about all the gossip and politics and social cliques that we cannot see, we might begin to compare one hospital to another by our perception of its internal communications. We expect the most from a hospital, and can sense tangled or loose threads—everything is reflected in communications with patients, patient care, and family support.

Now a hospital professional will quickly detect issues that reflect hiring or training practices, tensions between support staff and residents, or between residents and the administration. But, as we all know, it doesn't take a professional to sense that something is amiss.

The work that is accomplished through the cooperation of two people is not improved by a telephone or a new procedure, it is a very complex weave of social, cultural, psychological, and educational ingredients. However, if you detect the very same qualities not just between an occasional two or three people, but across the board then you know there is something amiss. It is probably not *just one thing,* but a whole matrix of inter-related issues that must be untangled and tackled together. The operant term here is *untangled,* a quality of or complex knotting, where multiple members have redundant interfaces relating to *entirely different outside* variables.

To cover this, we need to develop a means of speaking of *density* as a structural quality that impacts dynamic behavior in different ways. This will depend on a large number of variables in the nature of the threads, how threads are interwoven, and their individual ties to different aspects of the fabric's context. And by the *fabric's context* we mean external ties relating to the functions within the fabric itself, as well as all the nonfunctional interfaces which serve to highlight disconnections from its exterior. *Density* will be a reference to the structure of our definitions—both the constituents of the subject and its boundary characteristics. As such, one can expect a wide range of density structures, and we will need to propose these as *density classes.*

Logical Density: the paradox of density in one Euclidean dimension.

"Logical density," refers to a typical paradox of continuity. In the parable of the wise old tortoise and the hare, the hare has rashly agreed to Zeno's terms, racing across half the distance to the finish line in half the time, then racing across half of the remaining half-distance in a quarter of the time…repeating the procedure of continually finishing the remaining half the distance in half the remaining time but never finishing his race. Of course the wise old tortoise crosses long before him, but confused as he has lost sight of the hare. The reason is that the hare, in trying to complete infinitesimal distances has grown infinitesimally small, for he is only a cartoon. The *density* of the infinitesimally small is, in fact, what engineering curves –describing the *behavior* of materials under varying circumstances are all derived from.

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[86] Though this vein opens up a wealth of story-telling of the newspaper variety (which is not entirely transparent), I would add a story whose trail, or scent, is rarely followed. In my tender youth I knew a successful down-town antiques dealer, and one day left the store simultaneously with his major supplier. Since I was going the same way as he was, he offered me a ride and since I was already well into drinking age at the time, when we got to his destination (quite close to mine), he asked me into the bar for a drink. It was mid-day, but full of business men bent over their whiskeys. Now the supplier I was with happened to be a very well-known reformed ex-convict, and was still probably quite active in the underworld…as were many of his cronies in the bar. What was surprising, however, was that all these cronies accepted me as being the ex-cons new boy-friend, and treated me accordingly…accordingly well. This was part of another game, which was all part of their business –and their connections. I took nothing amiss, but began wondering about the ancient socio-economic factors around which Mediterranean culture may have turned. When I returned to school, I took this it to the Kinsey Institute people, as to the level of research that existed here, but at least, judging from the response I got—it was not the way the Institute cared about sex (at that time).

Logical density is as illogical as it is comprehensible. It is a way of conceiving of density that mathematicians have used to generate infinites, and to differentiate classes of numbers and spaces, for it defies granularity, space, and time. It is posited on the notion that one may always find something between you and your closest neighbor by "triangulating" what is half-way in-between[87]; yet this is another way of saying you can never find what is *adjacent to you,* because you have defined yourself as being part of a *logically* continuous surface. Now either you are part of the surface or you are standing on it. If you are part of the surface there can be no end to *you…*you cannot be both part of the surface of the line without being conjoined to the line. You have no end or beginning except at the end and beginning of the line itself. It sounds like a statement from *Alice and Wonderland,* which indeed it probably is, for Lewis Carroll was co-terminus with Charles Dodgson*,* who was a mathematics teacher.

If you insist on defining a line as that which exists between two points, the line is ephemeral—it is an aspect of the points; and points are neither big nor small but take up no space. In Euclidean space they are of 'zero-demension,' and as coordinates in space, they are ephemeral locii.

A Way Out of the Paradox

Of course, my answer (and it would now be vonEhrenfels' answer) is to allow *anything* of *any category* or class as admissible along the line: including all the things in your pocket and the bacteria adhering to your eyebrows. Suddenly we have a way out of the conundrum[88] which would now seem trivial and rather unproductive.

As I've already shown, we are very familiar with the type of dense weave of interleaving threads, or the densely knotted undergrowth of a forest, the thick variegated tangle stepping into a swamp, or the overwhelming numbers of suddenly connected sites returned on a simple internet search. Our way out of the Dodgson Dilemma seems rather forced and trivial, and yet it is present everywhere around us without a class of names. *Twisted* or *woven, tangled* or *homogeneous, chaotically dynamic* or *subtly cloudlike,* we need a way to discuss cross-dimensional densities in a coherent manner. We might only need some special definitions for that well-used but entirely ambiguous scientific term—*dimension;* a way to speak of "dimensions" as discrete worlds of action, with their own languages and meanings, values and laws of relationships.

This turns out to be somewhat more than a clarification of special meaning for the purposes of our present discussion. It is more like a paradigm-shift. It proposes a way to speak of something that is overwhelmingly present and entirely transparent to our attention. It is like the realization that our bodies are constantly being bombarded with countless (n-numerable) radio television microwave frequencies every second in a seemingly directionless manner—and that this is only one "dimension" of the omnipresent dynamics of being which we survive **without experiencing a thing**!

….That is, until we switch on a TV precisely calibrated to a single frequency—which is linearly exploded to produce the incredible detail of 4000 changing colored pixels cross-coordinated on 4000 linear rasters on our screen and nicely synchronized with another type of sound frequencies giving us our emotionally-charged music track, unless it's an American sitcom in which case it's a laugh-track. I'm very sorry for your creative capacity if you cannot accept the term "dimension" to cover this aspect of participation in the physical universe—to insist that it *only refers* to the world of Euclidean space made up of intersecting ideal but ephemeral planes defined by intersecting ideal but ephemeral lines which are ideal but ephemeral projections between any two points which are ideal but ephemeral locii in that space. For this seems to miss the point.

So alright. We have demonstrated the point yet again. James' "multiple realities" still apply to our world of experience, mitigating against use of such a limiting term as "dimensions" for something so vast. This is simply another way out. This is what any *logical density* is really pointing to. We have met it before in Augustine's Plenum.

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[87] Both the method of triangulating and the points being triangulated produce the differentiations, which Georg Cantor showed, the number of infinities that may be produced is non-finite itself…and there are an infinite "number" of *transfinites* available to the mathematician. *All of these, as generated in a single realm of math, we shall provisionally map to a single type of coincidensity.*

[88] Which I shall heretofore refer to as Dodgson's Dilemma of Density, or the *density of limits*, that highly productive use to which mathematical game of splitting the difference, otherwise known as the Calculus (where it is hardly considered a dilemma at all!)

Density in Physical Space

Physical space, outside of common sense that is more emotional than rational, is often considered continuous in terms of a "plenum." This is one of those wonderful words that fills in for something we don't know about and makes others think we know what we don't—for the truth is, the *real* nature of physical space presents a quandary, even to physicists. That the effects of gravity would seem, theoretically, to act over vast distances is only one of the problems. What we *do know* is that from the standpoint of particles contained in it space is quite discontinuous—for the particles are neither stable, nor even well-defined as particles, though they have the *appearance* of particles to our measuring instruments.

Waves are a different matter, yet matter, for that matter, matters little to physicists. They already know about quantum mechanics. For as long as you have a symbolic construct to put in place of an unknown—call it P or S or N, ɤ, Ƴ, or Ѳ—you are free to construct models and map your reality, and this is all that counts. We have already met this argument regarding what must be considered *physics* or *meta-physics.* Corporations may exist as legal people, and their investments may be legally considered under the laws of freedom of speech—and all of this takes place in a very physical world of experience…yet all our definitions are built on models that are inherently *metaphysical.* As long as you have a symbolic construct to put into place, models may substitute for reality and its measurement.

But how can we consider the *physical density* in this case? It is modelled in the space of quantum mechanics. It is certainly not *mass,* nor anything about *packing things tightly together.* At some point, beyond the tactile world of touch, things got tighter and tighter and then suddenly, drilling down to the next level, the density entirely disappears—opening up into a vast open space of *differentness,* where nothing behaves exactly the same but it is all perfectly adjustable to the rules of quantum mechanics.

The standard, common-sense notion of *density* may, in fact, no longer count as an appropriate term when you no longer have *things*, but must talk of waves and many-leveled frequencies, energy and fields, with the very occasional appearance of something like a particle showing up on a screen for a nanosecond. Perhaps we must simply jettison all terminology at this point, and accept that eventually the extremely expensive experiments in high-energy physics will pay off and we'll have a consistent view of reality that allows the language we are familiar with to take its bearings again.

But you may guess, since we began with the objective of expanding the use of the term *density,* I'm not buying that strategy. You may not buy *my strategy* of slightly remaking the language to allow for certain arguments of James and others, that *some of our definitions of things* don't jive with each other and that certain words are just slightly outta-whack. Density seems to be one of them. 'Chaos' might well be another.

Let us jump the gun on the expensive experiments in high-energy physics, and see if we can expand the usage of the existing term of 'density,' so that it refers to the quality so-named in all its current usages *and also allows us to translate it directly to that next level down, where traditional density seemed to disappear.* That extended usage will be a level *up* the semantic hierarchy, so that we can point to DENSITY'S PARENT TERM. Each of the different qualities of densities we have been considering here will be, in fact, sibling terms. The parent is a new term called 'coincidensity,' a portmanteau of *coincidence* and *density.* It will end up serving as our definition of 'thick,' or essentially what James is pointing to with *his* concept. To arrive at this definition, however, is a few chapters off….we need a couple more conceptual tools, and developing justifiable concepts is not easy, as James would quickly remind us. New words are easy, but Roget would be the first to insist on the qualifier *justifiable*, for when one invents a new term claiming to be a new concept, you had better first check the Thesaurus to see if the concept isn't already in the lexicon of thought. This particular portmanteau (coincidensity) isn't, for good reason. Pluriverses have never been too popular.

On introducing new words, in general

James insists that our 'concepts' rest on their origin in the percepts by which they were brought into being. *This is all that need be appended as a kind of universal qualification.* Every word in every language rests on such aboriginal percepts that were SOMEHOW derived from the 'blooming & buzzing' sensory narrative. Concepts must always rest on the original percept, and this must always interface SOMEHOW with the perceptual flux, which is met as the newborn infant encounters it…statistically transparent to change and distinction, so dense as to be opaque to any meaning.

In the late 1930's both Stuart Chase, S.I. Hayakawa (and a hundred years before them Alexander Bryan Johnson) had been warning educators, the public, and the media about the ultimately statistical basis of meanings in the words we use.[89] All of this is what James is referring to when he says that most of what we meet in the experiential flux is sensed within an entire framework of *concepts*—so that it is quite a rare experience to come face to face with pure *percepts* except as an infant or someone returning from a coma. It is also why he can say that his methodology of Radical Empiricism does not presume rational thought as its basis, but may suffice on intuition—with *rational afterthought* as its qualification and test.

So our concepts are always *postulates*, well-grounded in a vastly tested statistical experience of social knowledge. But from this viewpoint they are also *assumptions* that may eventually make fools of us. How this applies to the problem of knowledge paradigms should follow simply from here. A knowledge paradigm represents a language of discourse, a universe unto itself in which every concept represents a point on a much larger map of concepts, which seem quite implacably fixed.

A conceptual map has further analogies to a road-map. Just as roads and cities are not expected to move about from a 1920 Atlas to one of today, there are newly-planted suburbs, new bridges and super-highways making some of them "much closer" together than a hundred years prior. In regards to the concept map, James ask us to consider the *origin* of the towns and cities against the map of the topography—the fresh water sources, ocean and overland trade routes…to begin to judge what might have been the 'essence' of a town as habitation, market thoroughfare, or a defense outpost controlling a natural corridor… its economic sustainability for successful human habitation. In the course of time, with the growth of new cities and economies, some of the success is traded off, and we find vacant sepulchres of once-proud cities that are still on the road-map, but hardly thriving centers, and full of vacant lots where banks and homes used to stand.

Though I have already provided my solution with a new word, in fact, we are not done with "thickness." It lies at the heart of re-programming our notion of concepts as assumptions that always demand reevaluation. As we proceed in an attempt to put our hands around this *as an intrinsic part of a pluralist approach,* I will provide another quote from James. He opens Chapter XIII in *The Meaning of Truth*[90] points to the simple source of the assumptive stance:

> Abstract concepts, such as elasticity, voluminousness, disconnectedness, are salient aspects of our concrete experiences which we find it useful to single out. Useful, because we are then reminded of other things that offer those same aspects; and, if the aspects carry consequences in those other things, we can return to our first things, expecting those same consequences to accrue.

> To be helped to anticipate consequences is always a gain, and such being the help that abstract concepts give us, it is obvious that their use is fulfilled only when we get back again into concrete particulars by their means, bearing the consequences in our minds, and enriching our notion of the original objects therewithal.

> Without abstract concepts to handle our perceptual particulars by, we are like men hopping on one foot. Using concepts along with the particulars, we become bipedal. We throw our concept forward, get a foothold on the consequence, hitch our line to this, and draw our percept up, traveling thus with a hop, skip and jump over the surface of life at a vastly rapider rate than if we merely waded through the thickness of the particulars as accident rained them down upon our heads. Animals have to do this, but men raise their heads higher and breathe freely in the upper conceptual air.

> The enormous esteem professed by all philosophers for the conceptual form of consciousness is easy to understand. From Plato's time downwards it has been held to be our sole avenue to

[89] *The Tyranny of Words* (Stuart Chase, Harcourt Brace, 1938), *Language in Thought & Action* (S.I. Hayakawa, Harcourt Brace, 1939), *A Treatise on Language: Or the Relation Which Words Bear to Things* (Alex Bryan Johnson, NY 1836), *The Meaning of Words: Analyzed into Words and Unverbal Things* (Alex Bryan Johnson, NY 1854).

[90] 1909, McKay & Co.

essential truth. Concepts are universal, changeless, pure; their relations are eternal; they are spiritual, while the concrete particulars which they enable us to handle are corrupted by the flesh. They are precious in themselves, then, apart from their original use, and confer new dignity upon our life.

One can find no fault with this way of feeling about concepts so long as their original function does not get swallowed up in the admiration and lost. That function is of course to enlarge mentally our momentary experiences by *adding* to them the consequences conceived; but unfortunately, that function is not only too often forgotten by philosophers in their reasonings, but is often converted into its exact opposite, and made a means of diminishing the original experience by *denying* (implicitly or explicitly) all its features save the one specially abstracted to conceive it by. (Ibid. pp. 246-248).

Transparency vs. Opacity –a feeling for the Flux

So our road-maps and Atlases are mere exercises in assumptions until one drives the roads or even investigates on foot. So, too, does Radical Empiricism demand a constant check of those realities behind each of our concepts. Because when you walk the streets, and criss-cross the back-yards and railroad tracks you may see connections that weren't on any map at all….connections that a detective might have intuited by cross-checking maps, but things that may stand out starkly when you investigate directly. This 'directly' *means without using your conceptual maps for guidance,* without assumptions, without linguistic crutches or cab-drivers. This is what he means by investigating without thinking—and this is what I compared to extreme sports. To think will kill the performance, in this case, the experimental investigation.

But here is the key point that brings this piece of the conversation (the part we've been talking about throughout the book) to our notion of 'density.' For we are looking for things that are transparent to the maps, that 'come out in the wash,' that don't show up for some reason.

Goodman applied the term *density* to the symbol system in the language of the artist. We also saw it described from the opposite point of view, as the role of the artist to look so closely at things and their relations that you might find new connections, see what hadn't been seen but might be *seen.* This was later confused (in the cult of the artist) to simply find new ways to express things, or represent something only because you found a way that hadn't been represented before. But Ruskin's vision, in all his moralistic extravagence, was to show that the artist could *interpret connections.* My story about seeing colors the way 18th century painters had been taught to see them simply confirms Ruskin's claims—that there are actualities there that are invisible to most of us. Finally, the Gestalt school delivered the coup de grâce, by showing that the whole—i.e. the interpretation of something as a unit, as a shape or *thing perceived*—was a variable depending on all the internal and contextual components. And so it is no wonder that Goodman says an artist must have an analog-like symbol system, providing fuzzy mapping rules, by which to represent art.

Academics aren't supposed to be artists. Neither is the world of logic allowed to play in the world of art, lest it be compared to finger-painting. But having gotten this far, however, I am not at all content with *thickness.* When we are down on the streets of our city, having put aside all the maps—what is it we are looking for? What should we be taking in, if not at random, at lazy happenstance? How often should we pull out all the different types of map as we walk our suburban landscape—1720 housing maps with post roads and indian trails, 1885 utility grid, 1930 soil survey, 1940 tax map, 1950 business density statistics, 1960 transit routes and schedules? Should we note an ancient oak, lost stone steps or structures that survived from 1720?

We came to this particular landscape for a reason, however. Some anomaly made it interesting; we were bothered because *something* didn't fit with expectations, and we were curious.

It began when something seemed transparent, or *almost* transparent. We began with chaos and William James. *His* chaos is all around him…he is remembered as the man bearing the blooming buzzing confusion. We have seen why, because he has been trying to describe the pluriverse, or the multiverse, which doesn't exist for anyone else in the modern conversation. I have been slowly trying out an

alternative, a *pleniverse,* but it is doubtful that it should do much better unless I can show how James juggles.

But what was the transparency? The blooming buzzing confusion is acceptable. It is opaque. We know it and can feel it…which is why it has stayed in the language. This is, in fact, a flicker of inconsistency with our other experiences (of what consistitutes consistency in the academic realm). James is ONLY remembered for something we simply love to reference, but never get any further with—we love to reference it because it is so often the starting point of our particular conundrum, which we are glad to explain, because we have made some new sense out of a piece of blooming buzzing confusion in our particular field. The academic intuition that made us think of James' quote is because we were actually in that place James is trying to describe. We were there for a moment, in the flux, where the invisible and transparent coalesced, and we realized there was something actually *there* between us and our subject that we'd never seen before. It was a glass. We could tap it. That was our introductory article…it was Ernst Mach's notation that melodies are recognizable shapes. We could rap on it. That was Mach's assignment of the term Gestalt. We could push and distort it or shock it to make it crack into miniscule stress-lines and become translucent. That was von Ehrenfels' qualitäten. And now it became science, we found out how to induce a chemical reaction to make it opaque and workable to experiment. But the *origin* of this sequence actually began with Helmholtz's analytical treatment of harmonics and acoustics, and the visible fashion in which he made apparent that what everyone assumed was a simple and precise mapping of harmonic series—the Pythagorean perfection—*did not correspond to the perceived perfections through the acoustical media.* A physicist like Mach probably looked at all the data and started wondering why things don't map better, and if he were an amateur musician like many of his period, he'd begin brainstorming about other perceptual relationships that we had with the Pythagorean perfection.

Brainstorming begins by throwing out an inventory of every possible component in your field of vision—not just the focus, but the periferal vision of components in the context. And it would be here that anyone musically aware would see that different sequences of notes (i.e. melodies) prescribed different harmonic progressions…which is to say, different ordering hierarchies, or priority rankings from the harmonic series of the starting note, or tonic. This is all that Mach would have needed in his brainstorm to tell him that melodies had shapes that were also important to the harmonics, and modified our acceptance of the Pythagorean perfection as being 'perfect' or always most appropriate. Whatever the case, what had been 'invisible' was suddenly noticed as a slight inconsistency—and this was given a name, and fully developed as a concept. The word gestalt was soon to take on a very new and more extensive life outside of its native language.

Something may be invisible, hiding in relationships that might become apparent when we're actually walking the ground. These relationships can be said to correspond to percepts—and the way we perceive them face-to-face (in our metaphor 'on the ground' and without a map) *exactly corresponds to how we perceive them in thought.* We walk the territory, *or talk the territory*, and place this and that together to check their fit…then another this and another that…are the relationships that are unnamed percepts—there are too many of them to name and since they are all shots in the dark most of them don't register with anything. But what we are doing consciously is also what is going on unconsciously…our senses keep going behind the scenes, just as they don't stop processing simply for sleep.

The problem with the concept map of 'density' is one of those confusions. It is opaque and suddenly flickers. Is it simply a measure of interconnectivity? Is it a class of measurement, with ideal boundaries of zero-density and a density-of-one? Does it allow us to fill our pockets (i.e. add n-finite perspectives to any given point)?

The problem that art eluscidated for us should have been another flickering clue. Indeed, the clue has been in our face for a few centuries—since science ceased to be considered an 'art-form' and became a fixed procedural technology. How long have scientists deep in the bowels of pure research reminded us of the fact it is truly an art-form?[91] You don't schedule your breakthroughs. The mathematical logician Polya, who we met in our section on commensurability, reminds us that there are different sorts of reasoning—and that the break-throughs are made in James' flux.

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[91] they know research precisely for its twisting and turning [structural connotation], squeezing [process connotation], and tons of useless detrita, along with bureaucracy and personalities (i.e.the real shit).

Let us argue for funding in pure science. Any claim concerning the myriad *invisible aspects* of something, and what I alluded to in another context as the vonEhrenfels potential of its components, can be *essentially be met* with a counter-claim: what is the immediate potential for impacts on our purposes and reasonings? As long as things are invisible, "as long as there's nothing flickering in the shadows to suggest otherwise" we don't expend the energy of analysis. Even accepting the premise of vonEhrenfels' potentials, what you are suggesting investigating is a shot in the dark. The invisibility…that you claim is simply 'transparency,' is a statistical 'wash,' it is transparent precisely *because for our intended usages and any perspective that we currently know of using,* all things being equal, they cancel each other out.

Examples close to home are those persons scared to drive in a car because of all the things they've experienced over the years that could go wrong, with the car or the other drivers on the road. Or the hypochondriac whose life is spent troubleshooting all the invisible ailments that might be killing them. I know someone who subsists on both sets of fears, living on the couch, taking their blood pressure, which they can make to spike by remembering something they're fearful of….like high blood pressure.

For most of us, however, a question arrives only we observe a persistent flicker of discontinuity. When it is clear there are more than a few rough edges to what we have otherwise tolerated for years. At this point you might be willing to hear arguments that the rough edges are getting in the way. The question now is what are we going to do about it? Very few problems are worth the investment of taking thousands of shots in the dark to see what we will hit. The answer is to take a walk in the flux. We can't do this with our cars or our bodies yet, other than running lots of expensive diagnostics…but for the conceptual structures represented to cognition it is a different story.

James has told us the flux does not exist *per se,* that it cannot be described…yet he describes the feeling of being in it. And the artist would say, that feeling is what it is to feel in the first place— experience is all a matter of the flux. People have been making maps forever, since there were people— but there is no map for your experience. We're always on the ground if we so choose to see it that way.

Let me suggest that when I say 'being on the ground' the pun is intended. In my analogy, it meant walking the space without a conceptual map—which is to keep yourself open to anything you might see as potentially relevant. But the pun is with figure/ground of the Gestalt experiments, where the 'ground' is all that you are *not* focussed on, that may suddenly take over as the figure. We need a good way to speak of walking in the flux, so we can begin to talk about what to do when we get there….walking the ground and waiting for some realization (some 'gestalt') to hit us over the head. James says we 'make cuts,' but this is nothing more than a way of avoiding the term 'distinction' or some type of disambiguative sorting procedure. We have already assumed as much.

Disambiguation of the Flux ~ creating 'Apparency'

To begin, I will throw out a term for a "straw concept" that can be used while walking the territory. It is a term for that 'fluctuating something' that takes us down our ground view…an *'almost opaque,'* something that seems transparent to us but we can catch its flicker now and again, though we don't know what it is. That flicker, I will call a quality of 'apparency,' for it is not *altogether* transparent, but hardly opaque. In order to better speak of *apparency,* let me try to first *create it* for you. We are at the very same time, walking into our various realms of density—for we have seen that *opacity* and *thickness* was another route to the same ground, the flux in which we might give some form to what was otherwise transparent.

Consider the input for a computer screen being squished into a single vertical or horizontal line, as I described previously. If the screen was just black print on a white background, the line would undoubtedly appear black, but no blacker than any other black line. If the original screen, however, was a full-range color picture, the squashed line would assume the combination of colors of light—since our present computer screens are based on the code for projected light. White light is broken up into the colors of the rainbow by frequency spectra. On a computer, the colors are defined through a combination of components in the Red, Green, or Blue spectrum; combined colors, as with light, add up to white. So if you squished a full-color picture into a single raster line it would generally appear white. If this line is placed on a white screen it will be transparent. Opaque colors, such as we find in inks or paints, when they are combined generate black. So from the standpoint of color combinations it depends on whether

you are speaking of light or paint—at the extreme end of the spectrum you might say it is either white or black, transparent or opaque.

This example is *only* in reference to colors, and to no other qualities…we have not brought up vonEhrenfels' potentials, covering n-numerable qualities or universes of measurement or discourse. Our example has only provide a way to conceptualize the totally opaque as isomorphic to the totally transparent…. It is the stuff of the flux *before* we can disambiguate it. It is an example of our *ground*.

In unravelling *thickness* we must push through thickets of nested hierarchies,[92] and the tendency of parent/child relations to hide an underlying origami. *Apparency* (alluding to something transparent to us) must also allow us to refer to the kind of reorganizing combinations that the harmonic metaphor relates to—simple hierarchical changes that entirely alter a shape.

Two Experiments in Cutting through Density

Thought Experiment 1: Programming a Logically Dense Wash

I have created an assignment for a programming class to write a non-trivial program which will allow the user to toggle between an almost-black or an almost-white "screen-saver," which is to say, dynamic display. The screen-savers are considered encryptions that the user is supposed to 'break' by being able to predictably control discontinuities. It is a competition to see who can create the simplest and most elegant approach to the task without the source being discovered. The specifications are:

1. The display image must meet a certain (extremely high) percentage of total black or total white screen.
2. The program is to be dynamic over a time series.
3. The black screen saver and the white screen saver should be based around related program models, such that a solution to one will be a partial solution of the other. More credit will be given to programs in which flickering behavior of the two screen-savers are dissimilar.
4. Component raster displays over the time-series may be 100% black or white, but a percentage of component displays must be less than 100%. Thus, at least one screen-saver in the two related programs must demonstrate a distinct "flicker."
5. Hook 1. The operator must be provided with a front-end application, such as a function key that opens a pop-up window with an options box allowing one or more variables in the program to be modified, such that the position or timing of the discontinuity ("flicker") is altered. More credit is given the more apparent the change.
6. Hook 2. The front-end should provide a feedback "clue," or 'switch,' such that combinations or limits in the modifiable variables allow for the discovery of another variable that may be modified to *significantly* alter the outcome without giving away the underlying programming model. A 'significant' alteration might be to switch the screen to a single color. Giving away the programming model might be to disrupt the dynamics to such an extent that actual shapes begin to appear, allowing a competent programmer to reverse-engineer the program and completely disrupt it or take it apart.

You don't have to carry out this assignment to see that we have created a situation similar to what I described as 'apparency.' Our screen savers, whether black or white, will have some minor discontinuities. To make them more apparent, we could install any single student's program into a bank of systems, and initiate the screen-savers simultaneously. Several minutes of staring should make the flickers noticeable, and eventually familiar. Once we've become familiar with the types, frequencies and range of randomization of the discontinuities, we're ready to begin experimenting with the hooks.

I consider that making hypotheses as to what makes each screen-saver tick, and begin troubleshooting by modifying the hooks is similar to what James describes as "making cuts." Of course, in the world of hackers they are professionals at transparency; both in creating invisible virus code and in

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[92] I began this long trek with this particular destination in view. Unfortunately, it is directly across a rather wide conceptual gulf, and much of the way we have traveled and must still explore requires navigating a tortuous path down the cliffs and back up the other side, being forced to cut new conceptual paths all along the way. Once we get there we may see there was a good road available the whole time…but nobody ever put it on a map..

cracking encryptions. To a programmer, this thought experiment is naïve. Considering the range of von Ehrenfels qualities, it is trivial.

This is one version of what 'making cuts' *might* be like. It is an illustration only.

Thought Experiment 2: Dissimilar Outcomes in two similar cuts in paper

The following thought experiment has to do with the *interpretation* of a real experiment in cutting. That is, you can carry it out with paper and scizzors and a piece or two of tape. Our thought experiment is about the interpretation.

You may want to get out the paper, a scizzors and some tape and cut along with me. The exercise I have discovered is not only very esoteric but extremely non-trivial. It relates to a common figure in Topology called a Moebius Strip.

Bifurcation of a single-sided manifold[93]

The exercise described here originated a few years back when I decided to check out a factoid I had always repeated to others when discussing Moebius Strips: "if you try cutting a Moebius Strip down the middle it will never end, but just create a thinner and thinner Moebius Strip." As no one had ever challenged me on this, one day in my latter sixties I decided to test it. It is, indeed, a wonderful thing to try—for the factoid was wrong. Whoever had started it had stumbled on what I describe below as Result (3) without ever disentangling what was happening. Attempts to bifurcate a single-sided manifold edge-from-edge (i.e. splitting a Moebius Strip "down the middle" creating two distinct edges) produces one of three results:

Result 1.　[R1]　A single loop having two twists, twice the circumference of the parent [designated as R0]. The child loop has lost the topological structure of its parent, and is now double-edged and two-sided. [Further bifurcation of this loop will create a child loop [R1] chained to the parent. All further children will maintain connection to all parents.]

Result 2.　 [R2]　Two chained loops: one having a single twist with the same circumference as the parent loop [R0], the other having two twists and twice the circumference of the parent. The double-twisted loop has the same properties as [R1]. [Further bifurcation of either loop will have the same resultant properties as bifurcation of the parent [R0] or child [R1], all children maintaining connection to all parents.]

Result 3.　[R3]　Two chained "child" loops as in [R2] connected with an "isthmus" (or umbilical) that can be infinitely lengthened by continuing the incomplete "bifurcations" of the child loops, leaving each of the children at their original circumference. Cutting the isthmus at any point returns the figure to [R2], except that each child loop retains an artifact of the isthmus as a truncated tail.

The procedures creating these results are as follows:

- [R1] is obtained by cutting across the midpoint between the two opposing edges of the strip prior to completing the cut.
- [R2] is achieved by cutting parallel to an edge without cutting across the midpoint between opposing edges prior to completing the cut.
- [R3] is achieved by passing the initial insertion point of the cut. At the juncture with the initial insertion point, the cut may be continued either towards the original edge of the strip or towards the center of the strip with no difference in the result.[94]

<center>¤</center>

An obvious question must be raised in the case of [R3], since the cutter seems to choose to avoid cutting through to the insertion point, which is not by the rules. Sitting on your couch with a Moebius Strip and scizzors in hand you would say it is highly improbable to fail to *find* the insertion point, and in missing it, mistaking the new edge created by their cut for the original one, continuing to cut between the two edges as the strip gets thinner and thinner. But this is a thought experiment about a logical *structure*, where size is not an issue. What if you are a termite eating a cut in the paper instead of a human with a scizzors?

Since we don't want you to be a termite, consider a Moebius strip that is extremely wide, on a piece of paper the size of the Indianapolis racecourse, and you are left with your own little scizzors and the

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[93] The opening analysis, up to the symbol ¤ is extracted from an article, "Conjectures on the Bifurcation of a Point" first posted on www.academia.edu in 2018.

[94] The differences appear if u-turns are allowed, in the direction the u-turn takes, where the cut may reconnect to itself by creating a "hole" in the surface without actually bifurcating the edges. Holes are briefly discussed as "The Moebius-8 and other Cutting Deformations" in the article.

Herculean task of cutting a straight line in the quickest time possible in the dark. To accomplish it most quickly, you'd choose a point equidistant from either edge, for if you wanted the best chance of finding your starting point in the dark you'd most probably begin with a cut running parallel to the closest edge in sight, but by doing this would become rather surprised how long it was taking to meet your insertion point…for it takes twice the circumference to make your cut since you will soon begun cutting parallel to the side opposite your insertion point; remember it is defined as a one-edged manifold.   If you want to shorten your task you'll allow yourself to cross the center mark, equidistant from either edge of the track, but in this case unless the insertion point is marked with flashing lights you will probably miss it. In this case, if you DO eventually find an edge to follow it will be unknown to you if that is the *real original* edge or an artifact of your cut. Except by monitoring your time, it's doubtful you will notice the width getting progressively narrower until you have cut for several miles!

All this is very curious and interestings, but how does the experiment relate to our previous discussion? I bring it in here because we are investigating phantom 'cuts' in a phantom 'space,' in a flux or 'plenum.' In the previous analogy, I suggested that we generally only begin an investigation when we start seeing discontinuities in our expectations with things that we're willing to throw away the concept maps. It's then that we brainstorm, do an inventory of components inside and outside of our system or concept of interest, and then start walking the territory. The Moebius Strip is my model of what walking the territory is like, and our three different results are what James would call our 'cuts' –not the literal cuts in paper, but the three classes of result. Its introduction seemed appropriate here, though it seems quite discrete from the previous example of 'cutting,' or 'sorting out.'   There are a great number of new points to be taken from this experiment, for it highlights process parameters such as effiency (the difference in effort and time it takes to accomplish the three results) and continuity (the maintenance or loss of the original form), as well as a number of *mistakes* and *risks* to well-formed or ill-formed cutting. But it is most important to have this experiment behind us before we get into the next problem, which reduces the single edge to a single point, and begins to bifurcate *that*.

7. Perspectives on the Expansion of a Point

Considering the number ONE as the most obvious candidate for apparency ('thickness') a new approach to pluralism is developed leading to a general theory of *work* in which the primitive is disambiguation of thickness leading to "changes of state."

[-from the Introduction to Part 1, above]

[This volume] It presents a Jamesian model of chaos as the basic "state" in which "change" may be represented and life is experienced. What I've called "The Great Reality Sandwich" is an extreme model of a pluralistic universe—James' own model of a 'pluriverse,' which is a constantly interchanging its sandwiched layers and is never quite still enough to call "a universe."

…. If I simply explain how James' pluralism might work, I will have succeeded in this volume's objective. It's a long-shot, because scientists have been trying to get the rest of us to grasp an entirely discrete realm of quantum mechanics for close to a hundred years now, and we still haven't caught onto the idea of a universe that presents us with more than one reality at a time. Yet even quantum theory represents only two modes of a universal law, while James argued for multiples of such measurable realities even before Quantum Mechanics. And this is the task of this volume: seeing things as James might have seen them in 1910, before Schrodinger's Quantum leaps, Shannon's Information Theory, or Wiener's Cybernetics, before Chaos theory and Mandelbrot's factals.

It is quite appropriate to take a look at words that were previously presented in a new context; and because I cannot assume any normal reader (without hotlinks) would take my suggestion and return to introductory statements, I have included the statement here. This chapter, as well, might rest on its own as a separate booklet, but taken out of context I'm doubtful anyone would believe what I am trying to do— for it attempts to demolish the everyday commonsense understanding of the number One, and while doing so, append some new qualities to the number Zero. In the context of THIS book, however, such a drastic project makes sense as a way to see what James' extreme version of Pluralism might mean—for it clearly butts heads with our common notion of ONE while substituting a non-denumerable "many" for which I offered up the prefix '*pleni*.'

The Riddle of the First 1^{-45} Second

Except for the word "riddle," this section title might make little sense to anyone. In fact, we are constructing a thought experiment for particle physicists who play such games when discussing the Big Bang, and the very first work that had to take place in the universe, which they assume was the creation of sub-atomic particles out of, well, nothing. Now, since (some) physicists have actually designated time-frames *before the Big Bang,* in which all things necessary for the bang itself were put into place, you should also guess that these particular physicists are not particularly concerned about the idea of *nothing* either, and I will assume, for the sake of constructing our thought experiment that one needn't fully understand the Singularity Theorem that demonstrated how and why things must have come about in such a fashion as the Big Bang–for the same conjectures that resulted in the Singularity Theorem assumed we should eventually work out the causal hows and whys of the preparatory soup for the bang that set everything in motion.

The time-frame for my riddle may be somewhat out of date, for I took it from Heinz Pagels' *Perfect Symmetry*[95] which was published in 1985. This is quite a while ago for these sorts of conjectures which are updated at least every decade, but as this is still a thought experiment you shall see the specifics don't much concern us.

According to Pagels' version, from 10^{-44} secs. to 10^{-35} secs. Is called "The Planck Era" which leads up to the *beginning of the bang* that lasted from 10^{-35} secs. to 10^{-9} secs. From here to one second was the Bang itself which lasted for approximately 300,000 years of enormously high-energy, but opaque soup. After that came true linear time leading up to the formation of the cosmos, leading to incredibly ancient stuff that is still leaving traces of the work that can be measured by us humans; for however insignificant

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[95] *Pderfect Symmetry. The Search for the Beginning of Time* 1985, Billings and Sons, London.

we are in this mix, astronomers capture records from billions of light-years away which therefore were taking place billions of years ago.

What we actually care about is that the Bang did something, which is to say, it did *work* by changing the state of things. We care about how such work might come about—any work at all, but specifically the nature of the very first work that one might posit.

Now you should notice right off the bat, that I am accepting the talk of a single "universe" rather than a pluriverse. However, the goal here is to construct our thought experiment, while addressing a riddle that physicists still face, for indeed, although modern science can speak with such assurance of their discoveries regarding traces of measurable and recognizable phenomena taking place billions of years in the past, it is hardly as if several major riddles don't still plague us, depending on who you speak to and the context you speak to them in.

Now if you remember, in *Some Problems in Philosophy,* James couched his most basic arguments for pluralism within the initial premise that we must still consider *being* within a discussion of metaphysics and after that, there are essentially three issues: how concepts come about, the issue of one vs. many, and 'what is the origin (and basis) of novelty?' As noted previously, his book was then constructed by comparing pluralist and monist approaches to each of these basic problems, demonstrating that pluralism would provide more logical leverage.

At the moment, we are taking all the suppositions of the physicists about the origin of a single "universe" along with the strange concept of "a beginning of time" as acceptable and 'as-currently-proven.' This seems to run counter to James' arguments, but if we turn a critical eye back to James' claim of three essential problems in philosophy, we are still left with a need for *a logical* (if not temporal) starting point from which differentiation and complexity might sequentially explode into n-numerable finite realms or dimensions. James doesn't solve this for us. He leaves *conceptualization, one/many,* and *novelty* as his three foundational riddles, with the epistemological problem of asking about the ontological problem of being as the *modus operandi,* or contextual problem of all philosophical or scientific conjecture.

So our present task is not to address James' assertion head-on, but to take the physicists on faith, and construct our thought experiment about the very first *work,* which was to create the high-energy soup that created the first particle/fields from which the rest of the laws of the universe did the work of creating matter and space and form, etcetera and obviously ad infinitum. And I believe that in doing so, we can turn James' reductionist version of the role of all scientific effort into a self-sustaining process, or explanatory system—that from a pluralist viewpoint becomes somewhat of a self-fulfilling prophesy.

One

We begin with the almost absurd possibility that we do not know what the number One actually refers to. I will address the issue by constructing the concept of a point, a single point and no other that stands for the idea or concept of ONE. It turns out that ONE needs more than a good bit of disambiguation to stand alone like that; and it is from this disambiguation I shall posit a logical source to the nature of *work.* The expansion and projection of this single ambiguous point, is not to two points, nor to a line, but to an equally ambiguous *many*, which I'd prefer calling the PLENI-MANY, to remind us just how ambiguous it really is.

This will resolve itself into the kind of system that we're after—quite in line with James' arguments for pluralism—while providing some explanatory coherence to his three central 'problems in philosophy.' I believe the system we're after resembles experience as we tend to know it, arguing over it, carried out in the one or more universes that even physicists inhabit one at a time.

The Riddle of Riddles, and from Dilemmas to Lemmas

I will begin by taking a long step out of the present world of discourse to take note of the term *'riddle.'* There is method to this madness, for a riddle is not always what we take it to be. Claude Levi-Strauss, one of the founders of Structural Anthropology suggested that what we have often considered primitive myths containing riddles actually considered these riddles from the other direction, as lemmas of existence. The riddle represents THE ANSWER to which the hero and the listener must find the

appropriate *questions.*[96] Unlike Western Europeans who saw the resolution of a question as a goal or end-state leading to *progress,* other cultures stoically accepted existential reality; so the 'riddle' represented a challenge of life. One must recognize it and accommodate oneself to it, simply by using it to discover new ways to fit oneself into this basic and underlying knowledge. And this process is essentially to find new ways of asking pertinent questions. So whether Levi-Strauss is correct in supposing all riddle-myths must be interpreted this way, he is right enough in proposing that they should all be *optionally* interpreted this way.

Having introduced this optional way of interpreting a riddle, I will take a further step back into innocence…which is to say, our narrative consciousness… by introducing a myth I discovered in my writings about a cameo-merchant on a quest to answer the great riddles of the world.[97] It is relevant because it is this story that allowed me to solve the dilemma I introduced this chapter with, concerning the first work that ever took place.

The hero of the story has discovered an old sorcerer who had apparently solved the riddle of death, but now longed to die (having mistaken the riddle of life as being one's certain death). To help the old man solve *his* riddle, the merchant came up with what he called "The Riddle of All Riddles." It was, of course, simply another way to state or represent the challenge of existance, of living one's life, but the "answer" was a pun on life and the riddler's own 'question'. And so the story went:

> …you fashioned a spell thinking the greatest riddle in life was to conquer death, but your reverence for power and knowledge has left you longing for powerlessness *and* death. Now *this* riddle is the greatest riddle of (your) life, and you can't bear it any longer. When you discover a riddle to take the place of this one, old man, the curse of your spell will be broken."

> "Wonderully put," sighed the sorcerer. "For I can think of no greater riddle than myself, and it has been that way for centuries. I am very, very tired."

> The merchant stood up, wrapped himself in his robes, and with a deep and theatrical voice, said, "the poison is working in your belly as we speak, and so I will tell you the Riddle of All Riddles, and if you can solve it, you shall break the spell that has kept you alive for so long!"

> And with that, the merchant held up his hands to the sky, and chanted (as deeply as he could):

> "It has many fingers to point with, but can only grasp a paradox."

> The old sorcerer started to laugh through his pain, "why that is the silliest riddle I've ever heard! It's much too simple. I'm a wizard with riddles! The answer is 'a riddle."

> But then the old man's eyes opened wide and he wheezed, "you have outwitted me! It is not a *harder riddle* than all the rest, but the riddle *about* all riddles. Why, you really have discovered the riddle of all riddles, haven't you?"

> *Then the old man held up his hands and stretched out his fingers.*

> *"Yes, yes—it is even these hands, which have cast my spells. My hands are the image of the riddle of all riddles, and now another great hand stretches over them, its fingers touching mine in many directions. It is the Hand of Death!"* (Ibid.pp23-24)

[96] Elsewhere I have called this "the Kantian Flip" so that when one assigns something to the *a priori,* as a 'given' it implies constraints, and a line of questioning. As a 'given' it is *an answer* which can now be considered an *answer/riddle.* The connecton to Kant may simply be an artifact of having read him at the same time as Levi-Strauss.

[97] "Adventures of a Cameo Merchant" in *The Devil's Laugh and Other Stories,* H.Alan Tansson, 2009 iUniverse.

My hands are the image of the riddle of all riddles!

It is the story's conclusion that provided me with the clue…for I had never considered the riddle *pointing the other way—from its object (the answer) seemingly backwards at the one who asked it –who has now become the answer.* It was actual framing of the riddle in the metaphor of a hand ("it has many fingers to point with but can only grasp a paradox") and the the idea of multiple fingers pointing to contradictory answers, i.e. "grasping only paradox" which provided the set-up, for this is indeed what a riddle does. But the old sorcerer had conceived of death as *his* riddle (i.e. his paradox), and so when, in punning he feels "the hand of death" touching each of his fingers, solving both his riddle and *his personal instance* of The Riddle of All Riddles. Thus do we find this interesting inversion—and a new clue, which is appropriately called *directionality*.

Riddles of ONE

To say "All is One" is as easy as it is simplistic, yet we know it is an exceedingly deep thing to *mean*. It is rhetorical but cannot be questioned, for who could say (other than William James) that the universe is *not* connected, or that it is *not a single* universe we live in. It is *All there is*, and for many whom are overawed, this connected-to-all is called God. But as soon as we take one step beyond this Unity we realize with Augustine, Maimonides and Spinoza that we've been posed with this conundrum of diversity within God's Unity. I am calling this "Riddle A of the Number ONE": ONE the ALL, the Unity ONE.

Riddle B is of *Identity,* which is to consider invoking it upon other ONES, or even on other somethings—and this invocation is defined as yielding whatever is invoked, itself alone. This riddle considers *one* as a process.

Riddle C is the minimalist, rational concept of ONE. It is of a point, which in Sanskrit is 'bindu' also interpreted as 'the seed' subsisting alone in a void. It cannot be invoked on anything, for it is defined as lonely, alone, without partners or reflections. This, too, is ONE, *but it entails the void.*

Riddle D is the one we speak of as a "unit," a bounded whole consisting of parts—such as 'one body' or 'one car' or a 'single cell—including the entire universe of metabolism.' The minimalist form of

this idea of ONE is a binary unit, colloquially known as a 'bit.' This 'bit' may, in fact, lay claim to answering Riddle C, for some believe that the binary on/off perfectly maps the problem of "being vs non-being"; an argument which would not allow the bit to concatenate with other bits if it were true.

Now you may wonder why I am identifying these versions of the simple concept of ONE as 'riddles,' because they hardly seem to invoke such great questions. I shall argue that each of these represents *disambiguations* of our idea of the number ONE, and that any question which is brought to bear on any of them must be addressed to all….but in doing so I will show they return different answers. If this is the case, it should be fairly clear that the number ONE *needs* disambiguation at every turn—for we must be aware of this concept's ubiquitousness as an assumption underlying all thought and common sense language. Therefore, one must know precisely which ONE one is using at every turn.

I will start with Riddle C, the minimalist rational concept of the POINT. As I said, it is alone, but *entails* the void. As we noted in our previous chapter ("Stepping into the Flux") I discussed certain distinctions which might be made regarding 'the void'—and so NOTHING can be qualified. This is more than a manner of speaking, for 'the empty set' needs disambiguation as well. We must add *something else* to our problem, which is 'nothing,'[98] and yet we *already* have four riddles of ONE! Beware, for NOTHING is just around the corner!

Riddle A does not entail a boundary. It is about the ALL. There are no boundaries here. Riddle C entailed THE VOID —it cannot be stated without mentioning its "condition," which is to be "alone in the void," i.e. in the something that is nothing. The other two riddles didn't need this expression to be stated, but they may entail *conditions,* or a notion of boundary. So what could be a "boundary" for ONE? Riddle B (Identity) entails *other somethings* that it may be invoked upon, which imply a boundary of 'otherness.' Riddle D is a property of *being the boundary,* of defining the enclosure of parts and properties which can be denoted *by pointing at it with one finger,* essentially mapping *it* to Riddle C (rather than Riddle C to it).

Some people will tell you that logically the most obvious boundary to ONE is NOT-ONE, but a boundary is NOT 'negation,' for in speaking of *boundaries* we are talking and thinking spatially—the 'boundary' is simply "OUTSIDE of ONE." Notice that the wonderful Arabic symbol for nothing [0, zero] is also not a negation, unless you *invoke* it to *qualify* a numeral. What this *process* of "invoking" means (what is usually called "multiplying") has some interesting implications which must be addressed. Riddle B, *identity,* we decided was just such a process.

However, there is more to be said about our four Riddles of ONE, before moving onto our problem of boundaries or conditions. For the time being, we will hold to the previous definition of a 'boundary' as that statistical fuzzy CONDITION FOUND IN CHAOS, WHICH IS BEST REPRESENTED BY THE DYNAMIC BOUNDARIES OF A CLOUD OF GNATS OR SARDINES. We know nothing more of the term boundary, or conditions of inside-outsidedness, noting also that this will stay consistent with our present understanding of VOID. The expansion and projection of a point (Riddle C) will necessitate our return to James' issues, which I believe can tie them up into a consistent system which is appropriately *THICK.*

Disambiguating Identity from Binary units

The term 'identity' carries so much baggage as to require a closet full of shelving to lay it out. Te first confusion of the term 'identity' with ONE is brought on by a common (if mistaken) analogy of "one" with the individual. The anthropomorphic ONE is clearly Riddle D, an instance of the one/many problem—a unique and bounded self that is composed of innumerable attributes and constituents, a Leviathan of interlaced and interacting pieces that must be, according to some holding such views, held together with a single unitary *soul*. It is *this* identity that forever seeks its mate in self-replicating endeavors, and because this idea of 'self-replication' is so ingrained in today's arguments of process and purpose, we now have a UNIT of self-replication. This is to invoke Riddle B, which is the *process ONE* onto Riddle D, which is the *Unit ONE,* that I have already identified with the binary unit ONE.[99] This is not a simple process, nor is it to be assumed as a *natural* process that must always take place. It is an option.

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[98] I cannot avoid noting the pun here, for it has potential value, if only to English speakers. In a queer and jocular sense, *nothing*, or not-a-thing can very quickly become n-thing, or a finite expression for 'all-things' by simply substituting a dash for the '0.'

[99] This may in fact be a mistaken assumption, which I will leave to the next chapter to disambiguate. For some reason it doesn't sit well with me, as I feel I'm being misled by the terminology "BINARY UNIT" (bit). The discussion of my Risiology, which *imitates* a binary system with an expansion of the concept of identity will provide the context for this discussion. As I have not yet written this chapter, I can only say that

In point of fact, 'bits' and Information Theory may truly provide the logical boundary between the unitary ONE (as a boundary of a system) and Identity as a process narrative in which self-replication plays a central role. So my assumption that binary units (bits) should be considered an instance of Riddle D would be mistaken, misled by the terminology "BINARY UNIT". The next chapter on "Entailments" will provide us a better context for this discussion, as my Risiology *imitates* a binary system with an expansion of the concept of identity. I can only say that at the very least we shall fully disambiguate identity from binary units.

Pointing

Now 'digit' is another word for 'finger,' and a 'point' is another way of speaking of ostension, or the act of pointing. Quite often, any discussion of the theory of numbers is introduced with the idea of ostension. But by introducing and associating human digits (there being ten of them) with a term for a numeral's structure, i.e. a single digit, two-digit or six-digit number, we can return to the sorcerer's riddle and his outstretched hands *pointing at–while being met with—*the boundaries of his life, welcoming him back into the void.

My apologies for taking such poetic license with this demonstration, but you should remember that this is how scientists talk in the hallways. We can point with one finger, and I shall argue we can separately point with two fingers together, but we generally do not consider pointing with fingers outstretched at five or more discrete points. There are dogs that point with their entire bodies, as we gesticulate with a whole arm to someone at a distance, pointing at an oncoming storm. *But we do not consider holding out our hands with fingers outstretched to the heavens as pointing.* And what the old wizard in the story realized (and the picture here is useful) is that *when we intend to point at the All, our purpose is to have the feeling of the ALL pointing back at us.* This, in fact, was the 'answer' that overcame the old wizard's original riddle—entirely changing the purport of its meaning.

As I noted above, the story provided me the clue that the direction of pointing may constitute an assumption holding us back (rather like my engineers' assumptions regarding training as education), confusing our understanding of numbers as a mapping technology.

I will return to directionality, and reverse-pointing, after addressing one-and two-fingered (and more clumsy three-fingered) pointing. At least it is clear that when thinking of the concept ONE as a point being pointed at we are considering Riddle C, and not B *(identity)* or D *(unit).*

Two-fingered Pointing

First off, our confusion with the idea of a 'point' as a number is geometric, which is to say 'spatial,' whatever geometry you are using. When you posit any integer relation that doesn't come out evenly when you divide the denominator into the numerator, the "number" is still considered as resolving onto a line—finitely bounded by two 'pointers' getting closer and closer together. This is what I call "two-fingered pointing." It is rather a real relation such as Pi, that never achieves its integer representation on a line, but is just as much a 'number' as anything that fits nicely onto our chosen geometry. Remembering that linear representation *is essentially geometrical,* being a conversion of planar 2-dimensional relations to linear 1-dimensional relationships. In many such forced conversions of geometrical relations, the 'number' is always bounded by another 'inverse invocation,' separating the two points (i.e. our pointing fingers) by another smaller intervening distance—it is, however, by being "pointed at," just as capable of serving the role of that lonely point in its boundless existence.

Two-fingered pointing is not to be confused with binary pointing, which is a special logical class of *unit* pointing built on a special (ideosyncratic) notion of *negation*, which entails a special set of relationships of the one/many problem. As just previously noted, we shall take a much closer look this confusing sentence in the next chapter.

What two-fingered pointing allows us to understand in conventional mathematical reasoning is that whenever a "number" is considered in terms of its extensions (such as the 'finite but infinitely extendable numbers used to define fractals and attractors) we can say we are speaking of many-fingered pointing. These are "numbers" in that they can be specifically and uniquely pointed to, but it is pointing in

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at the very least we shall fully disambiguate identity from binary units, where 'bits' and Information Theory may truly provide the logical boundary between the unitary ONE (as a boundary of a system) and Identity as a process narrative.

the way that our eyes point, stereoscopically and potentially dynamically with REMs (rapid eye movements). Mathematicians already have a symbol for one such version of Riddle C in their toolkit of *[..i..]*(the square-root of negative ONE) by which you can point to a 3-dimensional location on a rotating X/Y axis to posit all the real numbers that can be reduced to a location where their 2-dimensional shadow intersects a one-dimensional line.

Now it turns out that *this* reading of "many-fingered pointing" has something in common with our Riddle D version—for while a numerical expansion cannot be mistaken for a 'unit,' the mathematical relations between the spatial and numerical perspectives of such numbers (results of n-fingered pointings) has yielded incredible fruit in the analysis of non-linear problems in science.

What needs to be borne in mind is that we have not stopped talking about the concept of ONE, but are continuing to discuss the relations between its instantiations in the four riddles posed. The purpose of this chapter, as I stated at the outset by introducing the "Riddle" of the Big Bang (what constituted the 'work' performed by the Bang that resulted in the first high energy particles/fields?) , was to show that we can generate enough potential relationships from the *mere idea of ONE TO REQUIRE MANY LEVELS OF WORK OF DISAMBIGUATION.*

The options for concatenating our four riddles is meant to demonstrate a source of logical complexity that philosophy has avoided up to now. To carry the discussion of One and Zero as far as we have here previously seemed specious…as if it could go nowhere. Having just expiated the logical sins of my discourse, I shall continue.

Reverse Pointing and the Origin of Work

The drift of all this has been to demonstrate that our notion of what should be the simplest of all notions—the concept of 'one'—is highly assumptive and *thickly woven.* We should not be self-satisfied that mere ostension, or pointing, does anything all that simple for us. Neither should we be at all comforted by the intuition of one-ness in a passionately happy moment when all seems unified. *Nor* should we assume that a point can be floated in a logical non-spatial nothing and survive.

I will begin by assigning the ONE of unity (Riddle A) a symbol of its own, and giving it a name:

$$§ = \text{'pacioli'}$$

The symbol is readily available on the ASCII keyboard as a printer's mark for a 'section' on legal documents. The name, 'pacioli' may be taken as a pun on an old game of chance (Pachooli is the oriental grandparent of pinball), but of course you should recognize it as referring to the author of the *Summa Arithmetica,* Fra Luca Pacioli, who is mostly remembered for bequeathing us the principles of accounting in 1492, when Columbus sailed the ocean blue.

I will ask you to bear with me in the following extrapolation of what the purpose of this new "number" might be. As it turns out, we can generate all the complexity that I shall assume for 'pacioli' from the inter-relation of the three remaining riddles of ONE, once we couch them in the previous Jamesian discussion of chaos and boundaries in the next chapter. I will give you a preview, however, of what might be done with our new pacioli, §.

Using §, Invoking Pacioli

When the dying sorcerer pointed with all his fingers outstretched he was invoking the universal, his own boundaries as a self in time—which, if one were to put in numerical terms, is to 'multiply by the number invoked.' Multiplying by pacioli is *not so inane as multiplying by "the infinite,"* for infinites are merely artifacts of finite relationships—which are n-numerable and not universal (by themselves) at all. Rather, to invoke pacioli is to impose an organizational *structure* of symmetry on any process, state, or representation—to enhance it through obligations or requirements called *entailments*. As we know from accounting, one posts every transaction on the General Ledger to two sides of the balance sheet. This is a kind of 'quantum-pair' that is operated on as a unit –both particle and field. It is here we might put Riddle D to use, for we have a single transaction that can be considered a ONE, yet a unit.

To invoke pacioli requires a multi-fingered pointing (Riddle C), as we have discussed it above. The 'number' of fingers (which in Pacioli's terms are accounts or dimensions of the transaction) is

irrelevant—for they point to a single event that is being linearized. The "balancing operation" that we know from accounting does *not* call out the identity form of the state or process or representation—so it doesn't work simply like a Hegelian dialectic or a Dawkinsian selfish gene. It is hardly that simple, because pacioli has four work potential "account" families. These are called *capacitances.* In accounting of course, the families are ASSETS, LIABILITIES, REVENUES, and EXPENSES, with another which represents their relations to the agent that has invoked it (or brought about the transaction, e.g. work); this agent in business accounting terms is EQUITY.

But what this does mean (using the analogy to Pacioli's accounting) is that while there are conventional ways to map a process, state, or representation to its balanced (DEBIT/CREDIT) instance in reality, there can be novel ways of recording it as well, which are equally balanced and submit to all the notational requirements.

In generalized transaction analysis we do not post stuff (states, processes, or other representational forms) with monetary assignments. In business, some default national monetary currency constitutes the standard measure. The family names of Asset accounts, Liability accounts, Revenue accounts, and Expense accounts must be waived. But at this point it won't matter what these capacitance account families are to be called when we are not posting values in monetary terms—this will take a volume (or two) of discussion in itself. All that we need to accept is the fact that there could be a very simple (and by this I mean 'elegant') way to conceive of structure as "arising out of nothing." We need simply hold out our outstretched hands to the heavens and exclaim "Some help with this disambiguation work, please."

This chapter, which is entitled "The Projection and Expansion of a Point" is meant to show that the Sanskrit had it right. All you need is a single seed, *bindu,* or point resting in the void. The entailments of this alone will be so *logically complex* as to creatively call out the rest. This is qualified as *creative;* and the distinction between invoking pacioli (multiplying by §) and pachooli is critical, for the accountant solves problems creatively—possibly not strictly by convention, and it may be judged right or wrong according to GAAP (Generally Accepted Accounting Principles). Oriental pinball works only with springs, balls and nails, which the engineer understands as convertable to a function (whether linear or non-linear).

Zero – a thought experiment

The Arabs concretized the notion of NOTHING by giving it a symbol with properties, but for reasons we've already noted, we can't trust Zero as sufficient to cover the various qualities of nothingness or void.

Let's begin describing a numeral system that includes the notation for zero. This system will approximate the numeral system we're familiar with, but describe our familiar numbers in a qualitatively different fashion. Each of the numerals to be used in the system is to be considered as having a unique character with regards to the other numerals. The numeral 2 represents a *unit* of two strokes; the numeral 7 represents a *unit* of seven strokes; each of these *units* represents a *single inter-relationship of strokes.* In this new sense, we are considering them as having the unitary characteristics of our ONE from Riddle D, but as *symbolic entities* they have very unique qualities when applied to things. Such qualities are, for example, spatial, if you were to consider the arrangements that 2 pebbles can make as compared to the arrangements that 7 pebbles might make on a plane, or connected in a network, such that the nature of the network wouldn't substantially change if it were attached to weightless balloons in a three-dimensional container.[100]

It will not matter yet how many symbols for such unique 'numbers' our system contains. However the system begins with ZERO. This symbol will represent the entire system of numeration: it will function as a starting boundary of the system set *as well as a system "*multiplier" when used to relate

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[100] Number theory provides riddle/answers of ineffable structures that we patently accept. The mathematical prodigy Ramanujan intuitively thought of all numbers as individuals, each having unique relationships to the other members of the number family in the way described here. Yet the continual discoveries of numerical relationships in the hidden 'structure' of Number Theory promotes the worship of numbers and structures (rarely called a heresy anymore, but rather Pythagorean bias) as being a sublime order of the universe…underlying all other relations. What this should tell us instead, is that there is something sublime (e.g. ineffable) in the causal nature of RELATIONSHIPS AND STRUCTURE…but that these only provide a key perspective on the differentiation of being and process (static vs dynamic, a human being vs a human doing). Artifacts of the difference between process and state (and the projection of one state to another is a process) which Pythagoreans considered worth dying for, have little to do with the *source* of the projection as God or some other *force* worthy of worship.

any numeric unit to the system as a whole. In this sense our ZERO has two functions, and there will be two ways to use this numeric symbol given our new expanded interpretation. If I invoke the *starting point* zero to anything (number or otherwise), it implies "unboundedness," or being "outside the system." If our zero is displayed on either side of another number symbol it implies invoking the system itself.

Picture the symbol 0 as a frame, rather like a set-symbol[101]. When you *close* the field by tacking zero onto the *end* of some symbol (such as 010 or 040) you will invoke that number by the system itself. The first number beyond the last symbol in our system (the symbol 9), and our first invocation of the system will be written 010. If the system had the extra symbols ⅄ and ∩ following 9, the first symbol after the system boundary interface of ∩ would also be 010, and to invoke the system of numbering on any one of those symbols would be the same as multiplying by the system's stated boundary 010, which now counts for twelve strokes, but would still be represented as 010. In this case 400 would invoke a three dimensional array of four strokes by twelve strokes by twelve strokes, having dropped the initial boundary markers of 00400 as a written convention. I am implying that in common decimal notation, we are also dropping the opening of the frame as redundant.

Our enhanced interpretation of the use of ZERO so far hasn't altered anything for conventional usage. To map our new zero to conventional arithmetic notation, we should note that "dividing" any of our unique numeric symbols by the system definition will have similar implications: either it is not allowed, or we can decide to allow it, and then assign the result a special interpretation.

It is easy enough to disallow the "inverse" of a system invocation (in arithmetic, division is the inverse of multiplication), in which case our new interpretation hasn't changed the utility of zero. It has only changed our interpretive perspective.

But what if we *allow* division by zero? Philosophically—given that we have a new directionally-specific symbol for the concept of ONE (§), we might also consider adding an inverse invocation of a system boundary, which is to *allow* division by our system boundary, zero. For example, we might show differences in the result of this division depending on whether the divisor—a unique 'number' or system of relationships inside the unit is a prime, even, or squared number. For now, knowing that any 'number' is also a 'point' on a linear projection—which may, through *identity* represent any of the additional qualifications of *unity,* e.g. §.

Since pacioli invokes dynamic relationships of potential and the possibility of work, we might consider dividing by our new zero as nothing more than multiplying the conventional *standard* Zero by pacioli, which is allowed through the conventional standard of *identity.* This operation provides Zero with the structural qualities of pacioli—it no longer implies the void or has anything to do with infinites. Rather it has to do with work. I have not determined which of the following best symbolizes our new enhanced zero, but have discovered many to choose from: © Ø ¤ Õ Ө Θ Θ☺♀

Having our new symbol for unity, §, which invokes a new range of permutative relations *within the unitary record of any single stroke*—having provided for its contextual mate—one might begin to intuit a primitive system of relations never before explored, relations that have as much going for them as Pi and number theory. We may now be allowed to consider inter-relations of structures at various levels of the physical, attempting to discover new sets of relational principles that might be tested through extrapolation to other levels and realms of reality. [102]

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[101] If I were to use the symbols from set notation and write (1 or [32 or {67 19 233 by this convention, it would consider each of them "open and unbounded" and their system value would be considered 'empty' or 'void.' I do not want to confuse the discussion of zero with set notation, however, and will leave this to the next chapter where we discuss "framing"….for the relational 'values' of numbers or characters separated by commas in a set can just as well be considered an extended numeric symbol within the system, and I believe retain all the characteristics of set theory. The only difference is this added operation of unboundedness, which has no reason for existence in set theory and should thus be transparent.

[102] I have already considered calling this new region of numbers Emotional Math. Just as physicists used the complexity of the color-wheel to provide comparable properties to be assigned to the force-class known as Gluons, the category of particle/fields into which photons fall, one designates the gluon's *color,* when of course it is not colored at all. Similarly, we will begin to designate certain infinities as *angry*, integers as *moody*, or geometrical figures as *happy*—-becoming true Protagoreans--making Beatrix Potter jealous to see scientists as more anthropomorphic than she. Joyfully (for those of us who miss childhood) the pages of *Science* will start looking more like *Scuffy the Tugboat,* enhanced with mammoths and Maxwellian imps as in *How it Works,* while students of Quentin Blake, Gustaf Tenggren and Tibor Gergely are hired for illustrations.

Pointing at Nothing

I have opened up the notion of ONE as a riddle with at least four answers, each posing itself as a questionable statement: "I am One!" Yet all ONEs must be equal, as if coexisting on a shaky Venn diagram. What we do know is that our confusion is real and continually confounded. We cannot accept multiple universes coexisting, and yet we can only speak of a single universe of discourse, knowing it occludes other versions of itself. This is rather consistent with the Vedic lore of ancient India that provided for a God with many different faces. No truly religious person could ever speak of the ALL of reality-writ-large; they would be satisfied with a piece of it, and one that could be turned over and inspected from a different perspective, given a different face. It is much like the feeling one gets from reading Plato or Xenophon's description of Socrates' dialogues.

For all that, we have not yet tackled a similar differentiation of the term VOID, which must be looked into at this time.

"What are you looking at, son?"

"Oh…nothing"

"Nothing? You've been staring at the horizon for hours. Do you see something?"

" No. Just staring"

"Something bothering you?"

"No."

"I don't believe you. You are doing something, you must have a reason."

"Just figured I'd never really looked in that direction. It was worth an hour or two."

"Did you see anything?"

"Guess I did."

"What?"

"Have no idea, but I must've just the same"

Etcetera.

What is the meaning of this exchange? Our boy was *not* looking at anything, yet his eyes were not out of focus. In fact, just as two fingers may point to something, it is inherent to consider seeing as a type of pointing, stereoscopically. In the chapter on art we considered how the eyes may dissemble distance and color, breaking up the spatial continuity into a more complex vision. We considered *density* as well as a density that might resolve itself from opacity to transparency to *apparency*.

One can simply stare. Yet, as our fellow acknowledged, he must've seen something "just the same." A practitioner of meditation could differentiate many distinct ways in which the mind tries to interact with its various boundaries—whether they be conceptual or 'n'-combinations of the senses and musculature of the body. Mightn't each posture, in fact, be considered a type of "pointing"? And so have we all experienced that dynamic of "staring at nothing," but have rarely been able to grasp some single essence of NOTHING in this way. It is pure and simply "no-focus" but it cannot be said to count as *no-thing*.

What we *can say about this exercise* is that it stays within the boundaries of our method, for *it does not invoke numbers, nor sets, nor concepts.* It also is not pointing to the ALL, which is to say, it doesn't invoke our new number § (pacioli). Yet our boy is clearly staring, and as such, *pointing himself at the horizon through his sense of vision.*. This may include other senses as well, such as his hearing and perhaps even smell…though we can only presume. He is *conceptually* unfocussed, he has in our ideal version of the activity, not let words and thoughts about this act follow upon his vision. Had the dialogue been expanded to a story, it might turn out he was actually contemplating suicide or frantically trying to

memorize a speech for class….but for now we can assume he had truly cleared his mind of words and ideas and any type of thoughts, either beautiful or ugly.

The connection to meditation techniques provides a useful clue—for the idea of meditation is to *reverse the direction of pointing,* just as is pacioli. And the purpose of this is to concentrate on nothing in order to rid the mind of exterior distractions so as to interiorize what is being pointed at, i.e. "to become aware of the multifarious nature of one's own body." Unfortunately, this is generally given some extra meaning ---such as a spiritual or medicinal connection to the ALL.

In the context of *our present discussion,* however, we are seeing the notion of a differentiated n-thing that may be interpreted as the boundary of the unitary ONE. Here the self obviously represents the UNIT, and the boundaries that are being breached through meditation are aspects of n-thing relationships— that is, relations within the flux that might be 'pointed to' through senses (rather than fingers). Outside of the newborn babe or the man coming out of a coma, this would certainly seem another approach to James' *pure experience,* which is why practitioners attribute holistic spiritual meaning (as healthy medicine) to meditation practice.

But for our context we need notice that such arcane traditions *rarely speak of numbers* but are always playing around with such mystical/magical constructs of the ALL, assumedly in the face of the void. This is because 'the void' is a natural and open assumption that still instills fear. Meditation supplants or overcomes this with a very different void. We will distinguish these again. In our earlier chapter, attempting to disambiguate *chaos,* I discussed three levels as a sort of 'contiguous region' that are naturally confused with "chaos." Void was one of them, which I described thus,

> "You cannot walk into the 'void,' but you can jump off the edge into it and suddenly find yourself in the 'flux.' The *flux* serves a function…to hold you, while the 'void' may be called the residence of the functionless. If you jumped into the void and *found* the void instead of landing in the flux, you would be void too, and of course there would be nothing left of you to find."

This is the void we fear, which Lewis Carroll named "Boojum." It is a kind of vacuum. It is the way we simplistically consider Black Holes; only there is much more definition to a Black Hole than this—they don't just swallow things up-and-out-into-nothing because they are defined as infinitely dense, that their gravitational pull at some point becomes infinitely suckingly one-way, even warping time. This is not evil, it is simply very dangerous. In *The Hunting of the Snark* the baker slowly and silently vanished away after discovering the long-sought quarry "the Snark is a Boo….." I will attempt to describe variations on this void just a bit further, since—given the idea of Black Holes—we know there must be plenty of options.

Let us assume, for a starting point, that a logical void such as a 'Boojum' goes beyond a simple 'vacuum' or 'empty state.' There is then a void (or even *class of voids)* that rips and implodes and dissipates into …. Itself. We have no special way of speaking of this (and we must be careful not to conjure up the idea of evil here, for we can impute nothing) yet. This particular void will *attempt to be* the converse of unity, the ALL. YET IT CANNOT BE AS IT IS AND MUST BE CONTAINED IN THE ALL, WHICH IS NOT A THING BUT A BALANCING METHOD, A FULCRUM. I won't bother carrying on with this conversation any further, as it is pure metaphysical n-sense, with no end in sight. I took it this far for the feeling… you need to get comfortable, for we are still going up—having further to climb with no ropes attached.

For our purposes here, I will also suggest that to stare at the flux, as an adept mystic or California meditation instructor might do, we are asing facing that process of 'reverse pointing at n-thing.' This is very important. This is how the meditation instructor is able to overcome or supplant the VOID that instills fear, *and as we've shown, for very good reason.*

Our methodology will now consider reverse pointing in the case of Riddle D, the ONE of units. It does this by first showing that there is yet another intimate connection between riddles, in this case between Riddle A and Riddle B. Once here, we can apply Riddle B to D and show how the boundary of Riddle D can serve as the Void around Riddle C—which already allows for multi-fingered reverse pointing. And although we're far from establishing any real method to our approach, the minimal objective throughout the book has been to justify James' pluralist option—blowing away assumptions of unitarian Monism. This exercise with ONE has entirely changed the implications of Monism for us, however, along with its faith that the world of number can provide basic clues to experience.

The Lemma of Punctuation

Riddle B of ONE was a process called *identity*. We are most familiar with it through the idea of *multiplying by one* to achieve the result of sameness, e.g. transparency to any change or process having taken place. From an existential or experiential perspective, this process could be going on all the time, continuously, without us ever knowing it, since it is defined as causing no change and is entirely transparent of impacts. The **ONE** of *identity* is, rather like the **ONE** of the unity of ALL, speaking to a kind of unity of time in which changelessness is possible. This would be confusing except that we've already noted that our Unity Riddle can be turned around as other riddles might, to be understood as if *they* are already the answer and your own understanding of yourself is in fact the *question*.

Now in modern scientific talk this comes prior to recursiveness for it is not a loop, merely our recognition of an entailment of directionality. We cannot escape the conundrum of looking at things, of pointing in a Heisenberg fashion where the looking and pointing are part of the outcome, *physically asserting the fact of pointing on the object being observed.* Thought of in this way, what I previously called 'directionally' might also be a way to consider nullifying the Heisenberg nature of pointing. That is, to observe the UNITY-factor, or possibility of reverse ostension could be to declare *the absence of directionality,* or *non-directionality*.

And I would like to suggest that this is what *identity,* or our Riddle B of ONE actually addresses. We *call* it "identity" because it is transparent to any change. It is clearly *not* the idea of *changelessness,* nor of the absence of time, since it could be invoked through the most radical transformations taking place in time and we'd *still* be clueless of its invocation. There are no differences noted. Anthropomorphically, we understand "identity" to mean an unchanging "relationship to self," no matter what changes may be taking place in the metabolism or the mind. The unitary "oneself" is little different than our numeric symbols representing sets of strokes, e.g. numerical *units.* So what we now mean by invoking Riddle B, is that there can be an ongoing *identity* created the boundary around the set that is itself unchanging over time, even though the system or metabolism or ecology internal to that boundary is undergoing n-dimensional transformations between any two moments. So in a sense, it is the ONE of IDENTITY *that allows* Riddle D to exist, *declaring* a definition of the interrelational set, the thick weave that constitutes the unit as a Unitary **ONE.** This is essentially the possibility of its soul.

Note that Riddle B was the only riddle that was defined as a process. It shouldn't be a big thing, therefore, to turn our riddle (i.e, our dilemma) into a *lemma,* another name for a definition that is simply declared by fiat or decree to serve as a basic building block of a logical system.

In the same way we turned Riddle A into a new symbol for the UNITY ONE (which has been missing in our conversational repertoire for this long), I will suggest that Riddle B, *Identity ONE* represents *the underlying process of* DECLARING *something*, e.g. giving it definition for later interpretation. We come very close to saying that IDENTITY ONE is the basis of invoking anything, that it is the basic process of all process. But this is not really what we're saying, and it shall still take us a bit before fully understanding the meaning of 'declaring something.'

"Invoking identity" is transparent to change. You cannot discern the process of identity being carried out, for it is going on alongside the multifarious transformations taking place within and without something. In arithmetical terms, you can carry out the most complex functions on something, and merely put it in brackets and multiply by one and the result is the same. You can multiply by one for a thousand and one times and the result is the same. It is not recursive, it is simply transparent to any other process— for it merely declares something being there in the first place.

The way out of the muddle is in the title of this section, which refers to *punctuation.* The term 'punctuation' derives from the word 'punct,' which means "point." This point can still be discerned in the punctuation declaring this sentence finished. The first punctuation in written language was to put an extra space between cuneiform words or heiroglyphs, which on the early steles had no special separation and were all run-on sentences, a situation which on clay shards used in war messages or legal documents could be the cause of major miscalculation. The current entry for 'punctuation' in Wikipedia gives many funny examples of such ambiguity, but it is no longer simply a matter of separating out a sentence, *but the thoughts that are nested within sentences*.

And this is where we are taking the idea of punctuation in trying to solve Riddle B of *Identity,* for it provides us a new perspective on the nature of a point, i.e. Riddle C, which if you remember was the lonely ONE sitting out in the VOID. Riddle C was the only riddle that entailed an external boundary, that had to be defined *within a context.* Suddenly, having discovered that a punctuation mark *is also defined as a point,* and, like our lonely Riddle C ONE exists only for its surrounding context. Most interestingly in fact, the origin of this punct, or punctuation point is as a substitute for the space, or void creating a boundary between sentences. Then, further uses were found, and the point-mark was modified just slightly into a comma, to mark off the relations between clauses, or thoughts, which were nested inside a single functional spoken unit.

The connections I'm drawing here are broad: I've assumed that there is an underlying meaning in the narrative or history of the development of punctuation marks, and have tied this to the happenstance understanding of a point in space or on a line. This POINT THAT IS NOW SUBSTITUTABLE BY A VARIETY OF DIFFERENT SYMBOLS was previously tied *to the act of pointing,* which is again based on my own thought processes in English-usage. It is happenstance but possibly providential (which is to say, "by good luck" or "an act of Providence") that all these ways of thinking of POINTS should coincide so nicely, just as the terminology available for "one" should be so sparse and ambiguous. Yet what is *not* open to a question of English usage is the ultimate connection between the idea of a point and the idea of "oneness," or that the activity of pointing to that point can have something to do with an expression of "oneness" such as "one apple" means that when I am pointing to an apple at the lunch counter I am not asking for apple seeds contained in an unedible core but at the apple it is entirely—a single UNIT also known as an apple-*thing*. It is also beyond question, that the objective of this book is to demonstrate William James' objection to our uncritical acceptance of the expression, "oneness", which he failed to show *actually* expresses "thickness," as a new and enhanced sense of multiplicity.

Within the more limited scope of this section that expands on the several riddles of ONE, my objective is to show that the lemma which defined Riddle B of Identity as "declaring something for future interpretation" is in fact the process of punctuation—and thus that when we declare an identity it is merely a way to set both internal and external punctuation around a unit that we choose to define as unitary, i.e. "as a one," "as a something." So now, having shown Riddle B, Identity, to be the basic invocation of a definition—no matter how complex its stated composition or internal functions—we have just taken a major step in describing James' problem of conceptualization. When we are out in the flux of "pure experience," trying to grasp the feelings of multiple relationships in order to create an idea, and from that a concept, we can be said to be punctuating something….finding its internal clauses in order to find its interpretation within our present context of action. That present context of action is a *pointing.* It is the process of holding up our hands with all the fingers outstretched, essentially dropping the directionality of pointing. *This dropping of directionality, with multi-fingered pointing, is the essence of Identity as a process of punctuation.* The default understanding of Identity is understood as that definition being transparent to change.

I must apologize for the poetic license. It is sometimes used in the hallways and lavatories of scientific establishments to promote inductive reasoning. We shall continue in a more contained fashion.

Augustine, yet again.

St. Augustine would have considered thoughts of the first $1^{-45\ second}$ as extremely naïve and assymetrical. To ask what was the first work ever accomplished –to worry oneself over Top or charmed Quarks, massive Tauons or colored Gluons is not a worthy dilemma. He presents us with the lemma of time having the seeds of both its own construction *and* destruction cleanly sewn into its original conception. Augustine holds a modified "block theory" of time, rather like Spinoza's but tied to an idea of chaos. Both Spinoza and Augustine have God continually in the original act of creation, but Augustine adds the chaos. He also is very specific about the problem of time and process. He demonstrates that we perceive the present as a momentary boundary between past and future, having no real duration—yet through all of these moment-less interstices, the present is carrying out simultaneous entailments from the future and the past. Changes are always taking place and work is always getting done in the way of thoughts and appetites and hopes and scribbling of scribes. Thousands of such authors have struggled with ways to express the strangeness of our personal conception and interaction with time, but Augustine is

possibly preeminent in describing it in terms *of entailments*, the conflicts caused by the linear metaphor of time—that is, the present as a moving *point* separating past from future, along with *other definitions that the self procures from within its narrative—the story woven from memories as well as fantasies or dreams of its purposeful endings albeit momentary interpretations.*

Our metaphor is again taken from the point, in this case a point in time. What Augustine attempts to show is that this particular point cannot exist in such a fashion—as a point separating two parts of an infinite line. It cannot exist *except* for its entailments. Note that this is similar to our definition of the lonely point in Riddle C, which entails the void as part of its existance. Augustine generalizes Riddle C to the entailments of *anything in the context. It needn't be void.* The point of present-ness (a point that is a moving separator between a *linear* past and future) entails essentially everything from the narrative of its context. From the standpoint of the person (here Augustine) attempting to perceive themselves in time, the past and future entailments from the narrative includes all of St. Augustine's "belief sets" (which we know are James' belief sets, and Bacon's before that). Considered from the standpoint of entailments, it is also a good description of THICKNESS. Augustine finds in this a notion of *Identity,* which he conceives of as the soul tied to the infinity of its maker. He is understandably conflating Riddles A, B, C, and D, to find in it a miraculous confirmation of everything he has ever been taught, and more. We will not let outselves get so overwhelmed as he.

For example, we know beyond a reasonable play of intuition that an autonomous agent such as ourselves–the independent point—exists, with both past and future (all time) converging on this point. But as we consider the narrative of ourselves in this very moment, leading to that very momentary thought underlying the comprehension of what we are reading as our eyes move forward across the page, the various acts contributing to the reading and comprehension along with whatever else we are multi-tasking, make it impossible to separate out the event from its boundaries---that is, pieces of the task are spread across a space on the line, while other pieces of our attention and story overlap but spread differently, as many different pieces of different tasks flow across a few minutes, rather like football players moving across a field around a ball. The ball represents the point we are attempting to tie down to a given moment. With Augustine's qualification of our lonely point in terms of its entailments—given the interplay which we've seen this point, Riddle C, has to the other three riddles, we are ready to move on.

The Structure of One

Having suggested that punctuation represents a process of boundary-definition, we have actually begun the process of stepping outside the four riddles by which we characterized ONE, and may be ready to define its structure in terms outside of itself.

"One" up to now has rested as rather of an unquestioned tautology that is always defined by reference to itself. It has become fairly clear, now, why this might be the case. However, our four riddles, when taken as separate characteristics of "oneness" have separate interactions—and as these qualities interact the ONES tend to masquerade as each other, thus leaving us with that feeling of a tautology.

The idea of punctuation has allowed us to define Riddle B, *Identity* ONE as representing the default punctuating process of assigning contextual boundaries, both internal to the components of any unit being defined (as unitary), and separating that unit from its external context. Yet this is what 'Identity' can represent to us. So let us use the term is 'Identity' and not the term ONE.

In our trial balloon for enhancing the notion of ZERO we were considering it as a similar punctuation—a boundary that served as a system descriptor for a particular system of symbols representing units of strokes or units of anything--cows, coins, or concepts. Not only this, but the idea of punctuation covers Riddle C, the lonely ONE by calling it a separator, or the mere orthographic mark that denotes a context. This lonely point is no longer primarily a symbol for 'oneness,' but rather for the local instance of an entire context and its entailments. Like the zero of our enhancement, this point, which we often consider in a graphic or spatial context, is the minimal "punctuation" or "moment" calling out a context. It is the potential *map* of a context—and it is appropriate that we have always considered it from the process perspective as "a pointing," or "ostension." The confusion, however, has been clarified having shown that the same role can be played by zero, functioning both a boundary and a system declaration. It is *this property of function* we can see as a property of punctuation. It is punctuation here, *not specifically pointing or inverse pointing,* for we've seen a similar (or tandem) role in the default version of 'Identity.'

Its declaration is transparency—it is 'one' serving as a declaration of the boundaries of the unit, which remain the same until a new declaration of boundaries becomes necessary.

The closure on all four riddles of One is with the UNIT definition, Riddle D. This, too, we've explained through the concept of punctuation. We are allowed to define a complex nesting of components as a simple 'set' of components of the same class (as our example of numbers, should we group them together with commas as separators), or as a complex system of toggled independent units holding together like an ecosystem rather than a swarm of fruitflies.

Punctuation will be a powerful tool –and it has shifted our focus away from James' one/many problem. If you remember, this was James' problem, which we called Riddle D. Our attack was by constructing three other riddles around it. There were other *outside* tools, or assumptions that allowed our discussion to progress, before discovering punctuation (PUNCT uation). Specifically these were the idea of 'entailment' and the process of 'invoking.' I was originally tempted to consider punctuation as a special case of 'invoking,' but this is an unwarranted assumption. We shall see that invoking is associated with, if not a property of, *nesting—*providing us with the hierarchies of scale we need to define certain boundary classes.

On the positive side, we seem to have covered two of the three basic problems James raises in in *Some Problems in Philosophy* (after ontology and epistemology). Punctuation, as we've described it here, besides addressing ONE/MANY, would seem to nicely describe the process of turning percept into concept, of putting discrete boundaries around an idea while placing it into its context. This only leaves us with the problem of novelty. A big problem. It is also a very hot issue. For Darwinians and all shades of anti-Darwinians 'novelty' is the pepper that gives the whole sandwich its flavor.

8. Entailment

The permutations of one are extrapolated and shown to have explanatory coherence redefining all three of James' core issues: one/many, percept-to-concept, novelty. Pluralism as a study of universes of discourse. Strategies of punctuation represent interpretation and testing function and value. Disambiguation of function becomes the art-form constituting all work. Carl Menger's definition of a 'good' provides some tools of economics to the logic of work.

Creation comes first.

An attack on the problem of novelty begins with some brainstorming over what is generally meant by the term, rather than try to explain where and how novelty arises. A preliminary survey of the general context of its meanings or synonyms includes *unique, previously unknown, fresh, discontinuous with expectations.* The term 'novelty' as we are considering it in the context of a 'riddle of being' also implies something taking place within the course of *an event.* Here is where the 'why and how?' enter the conversation. As an event the riddle is most appropriately stated:

'How do new things *appear?*'

'What are the causes and mechanics of novelty?'

'What does "novelty" entail?'

'What, in fact, does it mean for something novel to *come into being*? '

But this last question, begs a different perspective—that of judging or measuring relative novelty:

'What is required for something to be considered "novel" and unique? '

'What are the gradations of novelty…that is, can a situation be judged "novel" if we've arrived someplace "new" through *continuous* modifications, each of which is not novel from the standpoint of its contiguous state?'

The answer that immediately comes to mind, based on our earlier discussion of 'density' in art, is the answer that the Gestalt school would offer—that continuous modification of component relations, in the shape or structures of internal and external relationships, can suddenly provide the proper context for a new gestalt, a discontinuous and novel definition.

From the standpoint of a mechanism of novelty, the idea of 'discontinuity from the previously known' would seem to be a requirement for *independence…*the creation of a new line because of the introduction of a new capacity, or functionality, which implies a new definition. In a previous chapter we dealt with 'independence' in the discussion of *incommensurability,* of 'toggled relationships,' which we shall further define here. In the discussion on density we saw that some structural components may bring with them unique and fully independent relationships with the outside context—the example of hospital staff or independent economies at the loading dock were introduced. And in the previous chapter we encountered the concept of a definition's declaration in our term *punctuation.* Now it is rather fortuitous to have chosen this word, for it has another context of use, which is that of *a punctuating event.* A decisive battle can be spoken of as "the punctuating event in the war." From any given perspective "the punctuating event of the century" might refer to a revolution toppling a regime, a tsunami that destroyed a region's fishing fleets and forever altered the course of economic development, an Oscar for a genre of film that had never previously been recognized as commercial.

And so this is the direction I would take to solving the third of James' '*problems of philosophy'* with the term PUNCTUATION.

Given the above list of questions, which is by no means exhaustive (it was arrived at casually in a manner of brainstorming, rather than categorically), this new idea of *punctuation* also addresses a definitive event (i.e. an event that newly-defines), but says nothing about how "newness" is to be judged. The issue of continuity vs. discontinuity hasn't been answered. Punctuation merely refers to an event that brings about state, or condition—e.g. a declaration of internal and external boundaries.

Must our punctuation be new? Can't we allow a repetitive protocol such as PUNCTUATING EVENT B causes PUNCTUATION STATE A to change to PUNCTUATION STATE B which will revert back to its default STATE A until another event stimulus (the 'punctuating event') changes it back to STATE B , and so on?. This wouldn't count as *novelty*. We can no longer speak of "the punctuating event of the century" It is just an incomplete way of describing change. Yet in this fluctuation we can feel the existance of independence—for there is nothing to say that the next stimulus won't be PUNCTUATING EVENT G or Ǥ, Ⱥ, LIGHTENING FLASH ⱦ, BANKRUPCY ⱬ.

The requirement for a 'punctuation' in fact, will be related to what we generally consider 'directionality,' that is, the notion of 'irreversibility.' It will consist of an independence from a previous convention or protocol which governs any reversion to the declaration of boundaries for the above "STATE A." In this case, once the transformation from Punctuation B *back to* Punctuation A can be clearly defined, we have done nothing more than declare a *new or novel punctuating event* that didn't exist before. We can call it PUNCTUATION ABA—WHICH IN TRADITIONAL TERMS WAS CALLED A 'DYNAMIC STEADY-STATE.' THIS should simply inform us that *punctuations cannot be confused with static states,* for the fact is, neither Punctuation State A nor Punctuation State B exist any longer, once reversibility has been established between them.

This represents a rather interesting and new default statement for novelty—for we are essentially saying here that a punctuating event, as it is traditionally spoken of, is truly uni-directional and IRREVERSIBLE . This would *traditionally* (and quite normally) be spoken of as the introduction of "novelty." The assertion is that irreversibility may in fact consititute the default condition for change—what constitutes novelty is in fact the discovery and declaration of *potential for reversibility,* that the realization of the ABA steady-state actually *destroys the original states* as independent punctuations! We can never recreate punctuation states A or B again, because they will *always and continuously bear qualities of inter-relationships with them.* It is just like we can never again separate Energy and Matter, which were, before 1905 with the discovery of the EQUATION $E=MC^2$, irrevocably unique in men's minds.[103]

Returning to the idea of PUNCTUATION as a "punctuating event," we have turned the concept of novelty upside-down, making the dilemma into a lemma.[104] The independence of States B, Ǥ, Ⱥ, ⱦ, ⱬ from State A are given, dynamic change is to be assumed. Novelty only occurs when a translation between them has been established—that is, when a new definition of the world of relationships between B, Ǥ, Ⱥ, ⱦ, ⱬ and A has been established, such that any of them can be defined in terms of the others. Lightning and bankrupcies are understood well enough to be defined as potential events in a world that we place ourselves in —e.g. "they have known interpretations for us." We have assimilated them into a world that we understand as a steady-state. Novelty is the disruption of that interpretation. We cannot *declare* the steady-state—which is another way of saying, we cannot invoke identity as it was defined in our previous section.

It is not just a metaphor of thought and interpretation that this novelty impacts—for once the potential for a new relationship has been declared (and this *may be only in the realm of untested possibility)* actions must be replanned and efficiently distributed to cover the risks of failure. This would seem to apply whether a new theory has been introduced into the mainstream of thought, or a new functionality introduced into the tools of action. But we know that in the real world, mere novelty –even

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[103] The equation was the realization of a new relationship, a transformation protocol showing us the path (or at least the existence of a rough path) between our notion of energy in Newtonian physics, and that of matter in Newtonian physics relative, of course, to our notion of time in Newtonian physics, which was now a special entailment of the Theory of Relativity. For unfortunately, energy and matter were still defined relative to *space,* and movement of matter through space—which was relative to energy—was measured in time. I will let the reader extrapolate this back to their own understanding of what Quantum Mechanics did with the punctuation of space, or space/time. And there is a lingering faith that some time soon an equation will be discovered that irrevocably unites matter, energy, space, and time into one grand equation. Then, there will be no turning back. Or will the *novel* equation bring us to a spot we have already been to long ago, but simply with many more of the details filled in—and many of the ungainly misunderstandings and unfortunate oversimplifications done away with?

Knowledge merely mimics what is the case of reality….yet for all we know about knowledge (which James would include in the realm of *reals*) we might ALSO intuit or extrapolate the corollary, which is that "only God can return you to a state of innocence"—that innocence is to remove you from the universe in which the novel relation occurred, so that in another universe of discourse the novelty is not especially relevant because its functional context has been obscured from the alternate perspective.

[104] A lemma which should leave the awe and mystery of creation intact, for *mystery* is another term for 'dilemma,' and 'lemma' is another term for FAITH .

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proof of more efficient functionality—doesn't ensure the survival of an idea or technology. The slow and inevitable…inexorable…adoption of novelty such as was implied by my definition of the 'punctuating event' *that changes history, e.g. our interpretation of the world* cannot simply be a lightening flash out in the wilderness.

What this postulated definition of 'novelty' suggests is nothing less than a different way to describe *irreversibility* in terms of *symmetries*, where 'symmetry' is understood as a mapping or translation relationship through a *particular* rotation. Once a rotation is discovered by which one view of something can be turned into a different view with nothing lost we might also say we have an "equation." Now in this case, I have defined 'novelty' by the rather backwards idea that once a relationship has been discovered mapping characteristics of conditions or states to one another, these conditions may never return to their separate states. The rotation is one-way. But in the case of rotations and symmetry two things may be symmetrical (i.e. related as in a translation) in one way, BUT saying nothing about their relationship in regards to a different translation (rotation) which just doesn't translate.

They are *not* the same, though related, and so may in fact regain their independence, qualified by the fact that there is now a path between conditions or states that didn't previously exist. The existence of different rotations (or 'translations') would allow for reversibility. Rotations /translations' may be considered metaphorically, as from one universe of discourse (one of James' belief sets) to another; but they may also be physical… a random mutation might just have a way of testing itself out to verify its potentiality, and so our *novelty* might not be fully irreversible, but may change the statistical balance of the current steady-state definition. For example, what if the *logical* default of an accidental condition (a mutation) was to verify its capacity to influence things? Novelty will then consist of a *tendency* to irreversibility, still allowing us to define it in terms of the eradication of some particular independence through a newly-discovered particular rotation/translation (or symmetry).

Capacitance

An idea (such as was introduced in the previous section) or a new use for an old word (such as I shall demonstrate for the term 'capacitance') can immediately be recognized for its capacity for doing something or expressing something, for doing work—where truth status has nothing to do with it, only its work potential. Once I have added the broader meaning to the term 'capacitance'as "having the potential to do work," it will never *only mean* electrical capacitance again.

This becomes a new value introduced into the discourse, and if it can do work for others, that value *increases its survival potential.* The survival potential would be a measure of its "capacitance."

For a child to "have potential" says very little until someone invests in that child, and puts them on a path to fulfilling it. Even then, there is generally only a small possibility that they will succeed achieving its original goal. *However, the very fact that they are on a particular path will open up entirely new opportunities, which may better qualify the "potential" by actual capacity to perform—i.e. to do certain things.* This brings me to the reason to introduce this term here, for "Capacitance" might better be called "the entailment of potential," which might be considered making an obligation to verify that potential. The term 'capacitance' now means something more than 'having the capacity for work,'[105] and *this* may help us elucidate the relationship which 'novelty' has to *entailment*….for the entailment represents an obligation to carry out certain tests, to verify the claim of novelty.

But let's take it from a different perspective. We were considering 'novelty' in terms of 'the breaking down or destruction of independence, creating a distinct relationship tying one condition to another. A punctuating event, a unique state that is not further integrated into the world, having no further function will not be considered *novel.* This will actually not qualify as a punctuating event, but only as the default condition of change, for unique states come and go. All states, in this sense are 'independent.' They are "unique" and exhibit their default 'independence' but without redefining a new steady-state. Only then are they 'novel.'

We've grappled with the notion of *independence* in several places previously. VonEhrenfels' components all qualified as 'independent' by bringing in the gestalt idea of definition—such that the smallest modification of components might produce a unique shape (gestalt) that was recognizable on its

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[105] where I find the terms *endowment, intellect, talent* listed as types, and associated with *capability* the additional terms *power, strength, facility,*

own—both independent of the surrounding context, and recognizable under various mutations such as a melody. We introduced the term *toggled* as a tight but non-commensurable relation that preserved independence—tying it loosely to the metaphor of 'marriage' as well as the four relational classes of the Greek loves: affection, friendship*,* eros, charity. To place 'novelty' into these two discussions is quite consistent with James, where a condition of pluralism is *the default independence of things*. To state a lemma for 'novelty' we might say something like:

NOVELTY REPRESENTS A STRUCTURAL INTERPRETATION THAT IRREVERSIBLY REMOVES ONE OR MORE PREVIOUS STRUCTURAL INTERPRETATIONS FROM A PARTICULAR UNIVERSE.

This is a rather recondite way to consider such a great scientific mystery. I'll let you look up *recondite*. Besides stomping over James' third basic problem in *Some Problems in Philosophy,* it frees us in the construction of a set of terms that can potentially overcome the issues that have plagued science since his day. For we have begun to lay the foundation of a new logic of both events and relationships. Issues regarding the introduction of novelty can in fact be recast as issues of something else. The science of complexity and the modern paradigm of IS with its ubiquitous notion of *programming* will be freed-up. Or at least, that is my conjecture. Defining novelty in the above, obscure way, will certainly promote a clearer definition—but only when we have a different understanding of what "structural interpretation" entails. Or what, in fact, *entailment* entails.

We are now ready to return to next steps in constructing the logical framework begun when we sorted out the Riddles of ONE. I must remind both the reader and myself that one of our objectives here was to better understand the nature of *work,* which we are slowly redefining as a process of disambiguation—or, in terms that relate directly to our latest lemma, "removing one or more structural independencies from our current universe of interpretations."

Entailment was the imposition of a requirement on something, rather like an obligation. It was first met when we defined a point 'as resting in a void.' The 'void' was *entailed* as part of the definition, and instead of leaving it as an assumption, we were obligated to define exactly what this would mean. In fact, it implied *options* for invoking different qualities, depending on the nature of the void our point found itself in. We also used the term *entailment* to describe St. Augustine's conundrum of time—that the present could not be used as a mere 'boundary point' separating past from future, because it represented a host of entailments—rather like obligations of the past to the future and visa versa—all of which represented options being played out through the many accidents of one's present attention interacting with its context, e.g. a context of n-finite entailments.

Invoking was used to describe a process like *multiplication*, where the structure or quality of one thing (in our case a particular property of ONE) was applied to something else, giving it that property. It's been suggested as the way in which the different Riddles of ONE interact with one another, sharing their properties, and is specifically considered as the fundamental way in which the UNITY ONE could imply its structure of entailments on anything and everything. Invoking pacioli would represent a feature of causality—the necessity of carrying out entailment options to test them.

Punctuation relates to a process of declaring a particular relationship or set of relationships both inside and around a unitary ONE ('ONE' as characterized as a unit, having internal structure) providing its boundary conditions. Originally deriving it from our analysis of IDENTITY ONE, we called it *the underlying process of* DECLARING *something*, e.g. giving it definition for later interpretation. Note that punctuation is *not* a process of identity, but more properly describes what takes place between the juggling of percepts into a concept. Whatever punctuation *is* in James' description of the percept-to-concept process, may turn out to be a sibling of identity; that is, both have an entirely *different* parent allowing both to work as I'm suggesting.

I have already put the concept of 'punctuation' to work by visiting its *process use,* considered as 'a punctuating event'; and it has provided us significant leverage on the discussion of the terms 'independence' and 'novelty.' But we are far from being out of the forest. In our long-term objective of defining *work* and *disambiguation* there is plenty of structure to be worked out in the forest itself. To begin with, we have merely constructed a metaphor of 'punctuation,' employing both the conventional meanings of "punctuation marks" and "punctuating events." I believe we've dealt with the latter use of the metaphor sufficiently—our new use of the term is entailed by events, but we don't yet know what events *are,* that is,

we do not yet have a sufficient *grammar of events*. But if you ask me "what is a 'grammar of events'" I will tell you. It is the definition of WORK that we are after. But if you were brazen enough to ask "so what is left to describe in this new theory of punctuation?" I will answer—"every one of the punctuation marks, and probably more." Our POINT that we identified with a 'period' separating sentences, began as a space between them. If that space can be said to metaphorically represent 'the void,' and we say that in the human history of punctuation, the void turned into the period—by suggesting that this might be one and the same as our POINT , we have pulled off a "tour de force." I must state this most emphatically. The explicit nature of having used this metaphor 'punctuation' to include the definition of a point is 1) we have identified *contextual definition* with the unitary property of a single point, 2) we have allowed boundaries to include internal differentations of structure, 3) we have included process into this conception—since punctuations can be considered from the standpoint of causal change and independence of structural relations, and 4) by adding process into the conception of a structural definition, we have included a protean notion of *function.* If this isn't a "tour de force" I don't know what is! BUT, we still don't know what any of the punctuation marks in this new universe of discourse are. Neither do we have any idea of how they would get there, or why one might choose a comma over a semi-colon, or even an exclamation-mark over a question-mark. As you can see, by suggesting that the development of writing conventions should in any way parallel the ways of the universe-at-large, and that there may be some reality in stretching the plebean period into a whole panoply of inventions in the history of the printed word is a feat in itself. I find it hard to convince myself that the humble period is progenitor of all those other marks on paper (quite separate from the marks that are symbols for sounds or in some scripts, entire words), but this is indeed a known fact. To extend this parallel to the possibility that an ideal lonely point in space may play a similar role in the structural differentiation of experience is hard to swallow. I shall provide just such an ideal logical point, with an ephorvescent tablet (called the "projective plane") later in this chapter. But it should be clear, now, that the introduction of this term *punctuation,* is more than a metaphor. It is the beginning of a new logical interpretation of things. Punctuation is the primary *entailment* in this new logic. It holds change *within it*—which is to say, in the logic that allows for our new number § (pacioli), change itself will be defined in terms of punctuation. But only time will tell, for rest assured, if Augustine and Spinoza and Maimonides felt they could have a handle on time, we shall, too.

To begin getting a handle on what the various "punctuation marks" in our new way of considering boundaries might be, it is necessary to return to William James' description of the formation of concepts from out of the flux. The idea of percepts and concepts is important enough to revisit the original Jamesian quote we looked at previously. Buried within this quote I believe one can make out the beginnings of what we are intimately familiar with in the quotidian process of putting punctuation marks into our sentences. And in re-reading it, I would like to consider applying what James is talking about to describe this *ur-form* of putting punctuation to things—as if he is describing our particular problem of defining the internal and external boundary relationships of a definition—a definition which may indeed be tentative, but a conceptual order of so UNIT CONCEPT that can serve some stated function and be tested and tweaked:

> "The perceptual flux as such, on the contrary, *means* nothing, and is but what it immediately is. No matter how small a tract of it be taken, it is always a much-at-once, and contains innumerable aspects and characters which conception can pick out, isolate, and thereafter always intend. It shows duration, intensity, complexity or simplicity, interestingness, excitingness, pleasantness or their opposites. Data from all our senses enter into it, merged in a general extensiveness of which each occupies a big or little share. Yet all these parts leave its unity unbroken. Its boundaries are no more distinct than are those of the field of vision. Boundaries are things that intervene; but here nothing intervenes save parts of the perceptual flux itself, and these are overflowed by what they separate, so that whatever we distinguish and isolate conceptually is found perceptually to telescope and compenetrate and diffuse into its neighbors. The cuts we make are purely ideal. If my reader can succeed in abstracting from all conceptual interpretation and lapse back into his immediate sensible life at this very moment, he will find it to be what someone has called a big blooming buzzing confusion, as free from contradiction in its 'much-at-onceness' as it is all alive and evidently there.

"Out of this aboriginal sensible muchness attention carves out objects, which conception then names and identifies forever—in the sky 'constellation,' on the earth 'beach,' 'sea,' 'cliff,' 'bushes,' 'grass.' Out of time we cut 'days' and 'nights,' 'summers' and 'winters.' We say *what* each part of the sensible continuum is, and all these abstracted *whats* are concepts.[106]

"The intellectual life of man consists almost wholly in his substitution of a conceptual order for the perceptual order in which his experience originally comes. But before tracing the consequences of the substitution, I must say something about the conceptual order itself.

Trains of concepts unmixed with percepts grow frequent in the adult mind; and parts of these conceptual trains arrest our attention just as parts of the perceptual flow did, giving rise to concepts of a higher order of abstractness. So subtle is the discernment of man, and so great the power of some men to single out the most fugitive elements of what passes before them, that these new formations have no limit. Aspect within aspect, quality after quality, relation upon relation, absences and negations as well as present features, end by being noted and their names added to the store of nouns, verbs, adjectives, conjunctions, and prepositions by which the human mind interprets life. ..[107]

Declarelation

With all respect for Mr. Roget, who created his *Thesaurus* as a way to stop authors from inventing new words when they couldn't think of the right one, I have created a portmanteau of "declaration" and "relation."[108] Its meaning is to declare, by fiat or decree, a definition through a *set* of relationships between observed components of the concept being defined, whether it be noun, verb, adjective, conjuction, or preposition. *Declarelation* will precisely delineate to the best of its ability the "aspect within aspect," the "quality after quality," "relation upon relation," "absences and negations as well as present features" Its "cuts" will be purely ideal, but it will create something that can stand for, and meekly substitute for the 'much-at-onceness' that is 'alive' and 'evidently there.'

What I want this term to denote, however, is more than a new type of "definition," but one that specifically lists *entailments,* or perceived options for bringing things into relationships that perform the work of disambiguation. The reason that I've introduced a new term here, is because we shall need to relate 'punctuation' and 'punctuating events' to its sibling term of 'identity.' We shall eventually have to describe events that do not entail novelty from those that do, which standard usage calls "punctuating events." We will also need a way to measure such novelty, for our definition considered it only with respect to a particular universe—thus, what is a novelty in one universal interpretation is not a novelty in another, or may simply have a 'touch' of novelty.

For example, if a minor miracle were to be captured on video and transmitted through the smartphones of a hundred witnesses to the rest of the hooked-up world—and what I mean by a "minor miracle" is one such as the Bible relates happened to the Israelites on an average of one every six generations, or to those in the presence of Jesus throughout this man's time on earth—it would NOT be a punctuating event to the world of Biblical believers, but would be a punctuating event in the universe of scientific interpretations. For biblical believers—and I would place the very modern and quite rational C.S.Lewis in this category[109]—it would only constitute an affirmaton of belief in their "punctuation" of

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[106] a detailed footnote referencing other authors' use of the term *conception* and leading up to an argument with Kant occurs at this point in the text. Another bibliographic note occurs at the end of the next paragraph.

[107] pp. 48-53, *Some Problems in Philosophy*. Chapter IV. I have truncated the full quote, as its conclusion takes the text somewhat off-topic. But in deference to the complete idea, I include it here:

"Every new book verbalizes some new concept, which becomes important in proportion to the use that can be made of it. Different universes of thought thus arise, with specific sorts of relations among their ingredients. The world of common-sense 'things'; the world of material tasks to be done; the mathematical world of pure forms; the world of ethical propositions; the worlds of logic, of music, etc., all abstracted and generalized form long forgotten perceptual instances, from which they have as it were flowered out, return and merge themselves again in the particulars of our present and future perception. By those *whats* we apperceive all our *thises*. Percepts and concepts interpenetrate and melt together, impregnate and fertilize each other. Neither, taken alone, knows reality in its completeness. We need them both, as we need both our legs to walk with." (idem)

[108] Turning to Roget's own original edition, the closest terms we are seeking for 'declaration' are *affirmation*, *dictum,* and quite interestingly, *theorem*. Its most interesting antonyms are given as *qualification, call in question, impugn, disclaimer.*

[109] See *Miracles. A Preliminary Study*. 1947 Macmillan.

experiential affairs. The demonstration of the possibility of such "miracles" would be a very powerful invocation of Identity with their personal world view…which the world of science would have to either debunk or assimilate into *their* universe of discourse.

DECLARELATION would at this moment seem to be distinguished from 'punctuation' and 'identity' by its insistence on laying out *entailments,* which given Augustine's view of time, are more like obligations that have been laid onto the present to repay debts of the past, or carry out hopes that incurred past investments in the future. Declarelation in this sense carries a sense of *promises,* or *obligations,* and from the standpoint of bearing with it a definition, it might be said to fall under the notion of 'contracts.'

Flux relations

Before moving on to our further exploration of punctuation (for we are out in the flux, or in the tangle of the forest-for-the-trees&stumps&undergrowth, e.g. the blooming and buzzing turbulence of logical confusion), I would like to qualify our notion of what a "relation" might mean in the context of a "declaRELATION ." I've been fairly ambiguous in the usage of this term so far.

"Relation" is one of those words that can only be clarified to a certain point; like the conventional usage of "one" and "zero", almost any definition of the term returns on itself, tautalogically. We can speak of 'relations' by giving examples—but the kind of relationships that James is alluding to in the blooming buzzing confusion of the flux are non-specific. In his terms, they can be *felt,* and only somewhat disambiguated:

> "Pure experience in this state is but another name for feeling or sensation. But the flux of it no sooner comes than it tends to fill itself with emphases, and these salient parts become identified and fixed and abstracted; so that experience now flows as if shot through with adjectives and nouns and prepositions and conjunctions. Its purity is only a relative term, meaning the proportional amount of unverbalized sensation which it still embodies."

> …"In all this the continuities and the discontinuities are absolutely co-ordinate matters of immediate feeling. The conjunctions are as primordial elements of 'fact' as are the distinctions and disjunctions. In the same act by which I feel that this passing minute is a new pulse of my life, I feel that the old life continues into it, and the feeling of continuance in no wise jars upon the simultaneous feeling of a novelty. They, too, compenetrate harmoniously. Prepositions, copulas, and conjunctions, 'is,' 'isn't,' 'then,' 'before,' 'in,' 'on,' 'beside,' 'between, ' 'next,' 'like,' 'unlike,' 'as,' 'but,' flower out of the stream of pure experience, the stream of concretes or the sensational stream, as naturally as nouns and adjectives do, and they melt into it again as fluidly when we apply them to a new portion of the stream." [110]

We should bear James' intuitions in mind in looking for in concrete classes of relational structures providing punctuation. Adding another perspective to this, I found an interesting parallel to James statement in an argument for the language of science[111]:

> "Whenever we employ evocative words like "close," open," "near," "remote," "deep," "round," "behind," "after," "across" and so forth, we have entered, via the haptic sense, the promising plains of topology. Gradually one can detect "budding" haptic terms in algebra, terms which will sooner or later become incorporated in the language stratum that struggles with the findings of atomic and theoretical physics."(p.501)

The article quoted, by Wolfgang Yourgrau, is remarkable in presenting the mirror-image of James' own arguments in *A Pluralistic Universe,* which give his conclusions an interesting bias. Yourgrau presents all the supporting data *for* pluralism, using Poincare, and even Fechner, but argues *against* pluralism. He sees the problem of the language of reality used in the discussion of physics as

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[110] We have used this quote before. It is from *Essays in Radical Empiricism*, pp 93-95. . "The Thing and its Relations." [reprinted from *The Journal of Philosophy, Psychology and Scientific Methods*, January 1905]

[111] Wolfgang Yourgrau, "Language, Spatial Concepts, and Physics" in *Mind, Matter, and method. Essays in Philosophy and Science in Honor of Herbert Feigl.* Paul Feyerabend and Grover Maxwell. 1966 U. of Minn. (pp. 492-505))

being the central issue holding things back. He quotes Friedrich Waismann ("Language Strata" in *Logic and Language*. Oxford 1953) as arguing that "each stratum (of a language) has a logic of its own and that logic determines the meaning of certain basic terms." This, we can recognize in James' "belief sets," but Yourgrau calls this idea a 'weird concoction,' making logic "an organized procedure for going wrong with confidence and certainty…"!

Yourgrau's article is, in fact, quite relevant to what we are doing here—attempting to develop a logical bridge that can disambiguate our language to better deal with the realities that science attempts to describe (where science is the historical development of human knowledge as a tool to mitigate the risks of human life and improve the sustainability of human society). In 1966 Yourgrau considered this process as follows:

> Our goal is a less eccentric one: …. to increase and intensify those expressions which link haptic-topological-algebraic "naïve" terms with the corresponding mathematical formalism in future physical theory." […] "The days have passed when Lenard, Gehrcke, Fricke,….and similar crudely confused thinkers could ruthlessly fight Einstein's views in the name of so-called common sense or sane experience. Today the tribunal of scientifically and philosophically competent peers has arrived at its verdict without dissenting opinions: it is for Einstein and against (Euclidean) common sense. Besides, our common sense is definitely not Euclidean; moreover, one could with Poincaré contend that experience can neither confirm nor confute any geometry whatsoever; and finally, Menger[112] has shown that Euclidean geometry does not even possess the virtue of logical simplicity. […]"To form a measure, a "metric" (?) free from measurement in terms of rigidified elementary geometry and expressible in the protean language of analysis situs might prove an unactualizable enterprise. None the less, there seem to exist sufficient worthwhile intimations to vindicate the efforts of a protagonist, or apologist, in this unexplored field."[113]

I apologize to the reader for this apparent side-track, but it represents a very close associative linkage to our context of interest, which is a non-tautological way of speaking of the term '*relation,*' for this is what the entire realm (our 'forest') of punctuations must be about. Yourgrau insists that the world of relations cannot be simply considered in a Euclidean mode, and we have seen his emphasis is on something existing in what he roughly calls a 'haptic mode.'   What preceded the previous quote was an interesting set of notes regarding a contemporary of Yourgrau's named Revesz, in regard to his work with the haptic senses:

> "[It is not surprising that] Revesz indulged in some rather too distant, uncontrolled extrapolations concerning his original theory of haptic perception. Perhaps he was right in rejecting the view that visual perception can be regarded as the paradigm *Gestalt* as such, and certainly with respect to space. But he stipulated a somewhat foggy, amorphous basic function—some kind of primordial, protodisposition or instinct—from which all space-perceiving properties, tactile-kinesthetic as well as visual, are supposedly derived." (p.498)

Yourgrau immediately extricates himself, with an exclamation point: "There is not an iota of evidence for such a claim!" What is interesting is that Revesz seems to be echoing an intuition of William James' that we described in *Varieties of Religious Experience,* for something like Revesz' "primordial protodisposition or instinct" accessed by cognition in this work that all the senses must participate in "in

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[112] the mathematician, and not his father, Carl Menger, who we shall have reason to mention later.

[113] Ibid., pp.501- 502. What preceded this argument is an interesting set of notes regarding a contemporary of Yourgrau's named Revesz, in regard to his work with the haptic senses:

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Yourgrau immediately extricates himself, with an exclamation point: "There is not an iota of evidence for such a claim!"

What is interesting is that Revesz seems to be echoing an intuition of William James, that we noted in *Varieties of Religious Experience,* that there may in fact be some "primordial protodisposition or instinct" that is accessed by cognition in this work that all the senses must participate in "in the flux," where space-perception, tactile-kinesthetic and visual cognition arise.

the flux." It should be remembered, here, that James began his academic work as an MD, and Professor of Physiology at Harvard; the springboad of all his later philosophy is the encyclopaedic work on the physiology of cognition, *Principles of Psychology.* So this talk of extracting those basic relations from *percepts* that become our conceptual framework is essentially cognitive—James does not believe in pseudo answers like the "black-box" that performs some cognitive function. He knows that ultimately that little black box must be programmed with some structure out of matter, else you are left with a "spirit" performing the filtering and measuring decisions inside the black box. Space-perception, tactile-kinesthetic and visual cognition may well arise in boxes, but their operations must eventually become transparent. When James is speaking of "the flux" he is conflating the work of these boxes with the space/time context of the cognitive self as functioning unit. The interface with the space/time context is logically chaotic—but something is going on to disambiguate the blooming and buzzing of that interface. There may be many such 'boxes,' but they cooperate within the system of the unitary self to do the *work* of this disambiguation.

 Our logic of ONE has provided us with the new concept of a boundary called 'punctuation.' As a tool of language we can now better begin differentiating functional types of "punctuation marks" –and we can be fairly certain they will *not exist merely in a spatial context—*for just as sure as the Euclidean realm is insufficient to describe all classes of relations, we can be assured that Yourgrau's 'topology' will not fair much better. Topology is a realm of mathematics with a powerful scope of coverage, but this doesn't speak to all coverages—our directional concept of pacioli, alone, throws topology out of the running as a universal sorting class for the term 'relation' as it applies to punctuation, or its parent process of *declarelation* (which include *identity* as a sibling to punctuation).

From Independence to Coincidence

 We earlier introduced a term for relationships that begged any firm definition—our best analogy for the complexity of 'toggled relations' was *marriage.* Nearly all cultures define marriage by a contract, e.g. Obligations. Marriage, in point of fact, perfectly describes a state of multiple n-dimensional entailments. Leading up to marriage, in a very anthropomorphic sense, we have the four classic loves: Affection, Friendship, Eros, Charity. These can be further broken down, but the four[114] provide enough grist for anyone's mill wishing to describe structural relations between unitary systems in a context of similar system. For anyone who wishes to dispute my claim that topological treatment of relational terms in science will be insufficient should try it on *marriage* or the loves. These are properly relational, and while this needn't be demonstrated for our purposes here, I intend to carry out the analysis in the second volume (*The Work of Emotion*) of the trilogy into which this book belongs.

 The reader should have immediately made the connection between the idea of *marriage* as a set of n-dimensional entailments *under contract* and our previous discussion. It would seem that logical relationships (and by this I am stepping out of the anthropomorphic context) can have what would otherwise be considered *time-relations* as a primitive quality. Contracts or obligations have to do with defining *periods* (and the pun in English is not intended, but may be noted as returning us to punctuation) in which they are considered valid, to be carried out, or repaid. To play a game is to be obligated to a set of rules governing one's *relations* with other players for the *period* of the game. After the game players may be brothers or best friends, but during the game they are obligated for their team to operate as enemies. All this must be covered in our talk of "relations."

 To make the talk of 'periods' more complicated, when we speak of an "accounting period" we are "closing the books" on anything that takes place after 'time/day/month/year' and will put together everything that has taken place in an enterprise since the last time the books were closed. It doesn't matter how long this period is—it will all be shuffled together to derive a "bottom line" value of the enterprise. The accounting period will produce a point on a graph. All transactions, all modifications and changes that have taken place in the company considered as a complex unit will be analyzed and treated as 'logically coincident" in time. It is a formalization that provides much more than a single number on a graph, but it is yet *another* way to speak of the logic of "relations." As with *marriage,* an accounting period is established 'by fiat,' or decree. It is a <u>declared</u> relationship that is independent of the paper it is

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[114] Best described for mapping into systems terms in C.S.Lewis' *the Four Loves* (1960).

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written on—and yet it is only as real as that paper, which is a symbol, for the symbolic representation becomes the legal basis by which all sorts of future actions may be regulated, and liti*gated,* which pertains to putting them and keeping either a marriage relationship or a business enterprise in order.

At this juncture, having added the idea of temporal entailments to our primitive notion of relations, and having considered the idea of *toggled* relationships of semi- or pseudo-independence, we must return to Augustine's POINT in time, the present, which he shows cannot wholly function as a separator between the past and future, but which *appears* to be a boundary between these realms of reality. What he alludes to is that we must speak of "the present" as an *extended event,* quite like we considered an accounting period both as a complex of transactions and changes as well as a single "bottom line." Another way of describing this "period" and "present" is as *coincident.*

The lightening flash, which our senses observe as taking place in a moment, is of course spread across nanoseconds in time. Similarly, what our ears detect as its eventual "bottom line," or "crack of lightening" is composed of trillions-to-the-n^{th} of micro-'synapses' of electrical capacitance turned into energy, whose sound by the billions amounts only to crackles. Many of these take place simultaneously, in different spaces across a limited area of the atmosphere—but the bottom line is in fact a 'declaration' of *coincidence.* The lightening flash is a spatially and temporally bounded event defined, pragmatically (by its real impacts on the world) by a measure of *coincidence.* And that *coincidence –the bolt of lightening—* becomes much more than the sum of all the crackles of electrical charges that may become dissipated in a path through a some blasted tree-trunk into its eventual ground. And that coincidence has manifested a direction, not entirely at random, but independent of any forethought on the part of Zeus.

Coincidence, Punctuation, and Declarelation

Coincidence, as we just illustrated in what may be a unique case, but which I would tend to bet can be generalized, is the measure of spatial and temporal boundary that creates something quite beyond the sum of its parts. It is more than the paper representation of a corporaton or the contract of a marriage, which did something very similar but in a less emphatic way. A marriage contract does include a notion of temporal and spatial coincidence in it, as well as a strong set of entailments (binding-boundaries) about mutual functionalities. The shared functionality of crackles in the bolt of lightening is pretty monolithic, but also clearly functional. The four loves, as well, yield different 'bottom line' values (something we call *feeling*) that might be called more than the sum of their parts.[115]

So my hunch is that we can start looking at some form of 'coincidence' as an objective state, i.e. the goal of doing work and setting up our punctuating relationships. This is not only because the lightening bolt is so often used as the paradigm of "a punctuating event," but because it introduces a major transformation in the way we bring together unrelated things into a new form that exists for itself.

Yet there is something else that ties coincidence to independence—for our punctuation must somehow define or delineate –e.g. disambiguate—all the newly-tied relationships, which is to say, at the very same time a punctuation brings things together into a unified and novel interpretation, tying something to its universe of discourse, it is defining all the internal parts in terms of their mutuality *and independent functions.*

Independence in Information Theory

Now 'independence' is often considered the underlying quality of entropy—whether it is defined from the standpoint of Information Theory as a measure of indeterminacy, or in physics as a measure of disorder. In Information theory, the level of independence of a character or word from another is qualified by the overall contextual 'redundancy' in the message, how many *other clues exist to determine how the word or character is to be integrated into the overall unit.* In physics, we are familiar with the 2nd Law of Thermodynamics as being the driving force *against organization...*that if no organizing principles are applied, "entropy will increase." The guiding principle in Information Theory is that *information* is itself the organizing principle *par excellance.* Whereas raw data is merely un-interpreted bits of potentially useful information, *all data components being considered fully independent in this state*—the interpretation of this data puts it into relationships with one another, quite like our idea of 'novelty,' above.

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[115] This was, if you remember, the underlying emphasis of the Gestalt school, and von Ehrenfels' qualitaten.

Once the data is turned into *information* it is very hard to turn it back into rough data unless we throw it into a new container and attempt a translation.

Information in this sense is not generally novel. It must conform to preexisting translation mechanisms or protocol, i.e. it must be *interpretable in conventional terms.* This, however, draws a connection to what Polya distinguishes the difference between 'plausible' and 'deductive' reasoning— where 'deductive' will conform to strict translation laws. We assume that information does as well, but Information Theory considers *information* from the standpoint of *plausibility,* and working with what Polya calls 'plausible reasoning.'[116] Polya's distinction is important to us, since most information translation is carried out according to conventions that have been pre-established. So to this extent, information will be put together in unique and novel fashions, but will not be especially "novel" as we defined it above. Truly novel information must cause a paradigm-shift in the interpretation of *every relationship in the universe of discourse.* As such, it is nonsense, and merely disorganized data from when attempting to interpret if from the old universe of discourse.

Coincidence in Functional Relation: Entailments as *needs*

Let us brainstorm an idea. In setting up a proper brainstorming session we might lay out a certain number of ground rules or constraints defining the possible *needs* to be met, and then begin throwing out crazy ideas…almost anything can be thrown into the pot, sussed for possible relevancy, and if it passes the gross filter, put up on the board for later development. Your group happens be on a mission to save certain wildlife, and in considering things from the point of view of these birds who depend on a certain type of salamander, you might very well come up with an entirely feasible idea that could be used to heat swimming pools for nothing, but of course it has nothing to do with the organizational purpose, but the novelty of the invention will be joked over and duly noted and thrown out, having served a very real need of loosening up the group to more relevant ideas. Now perhaps years later someone from that session meets a swimming pool contractor in the seat alongside them on the plane, and happens to remember the idea. Here there could be a *need* to realize (make real) the interesting idea. But there is only a slim chance that the contractor will have more than a passing interest in holding a conversation on such entrepreneurial schemes. Developing an idea from conception to babyhood is a hard and painful process that can kill anyone without the proper business structure in place for giving birth. Our contractor is interested in being noticed as an individual, not to be hyped by an amateur salesman to reorganize his priorities to find the means and opportunity to be that birthing agent. Indeed, the idea might eventually make it to the Patent Office and make it into the swimming pools of the world; yet it matters to us, and our discussion of 'coincidence' whether it was ultimately caused by a causal string that began in your board room OR was brought about years later because some other innovation in heating elements made the idea obvious.

Our swimming pool heater could be considered an example of the kind of fortuitous and entirely random mutation of a structure that has plenty of functional potentials, but occurs in the wrong time at the wrong time. It requires coincidence with a specific need. This is what the *functional* aspect of relational coincidence means. The entailments to bring about novelty in the sense that we've discussed novelty are quite complex.

But here we have been looking at punctuation in terms of a new term, which is *need,* bringing us directly into a new sphere of discussion, and this is the difference between *needs* and *wants*, insisting on some of the basic (even if grossly anthropomorphic) variables of economic thought. The connection to economic theory was obviously coming when we introduced a *functional* aspect to classifying relations inhering in the temporal notion of entailments. If you remember we spoke of the idea of 'obligations' and the functional qualifications in the 'marriage contract,' where the idea of *marriage* was considered purely as a class of toggled relationships.

I was not actually speaking the language of economics when I discussed an 'accounting period' as an example of coincidence, nor were we really speaking economics in using the figure of speech "Bottom

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[116]Polya states: "Demonstrative reasoning penetrates the sciences just as far as mathematics does, but it is in itself (as mathematics is in itself) incapable of yielding essentially new knowledge about the world around us. Anything new that we learn about the world involves plausible reasoning, which is the only kind of reasoning for which we care in everyday affairs. Demonstrative reasoning has rigid standards, codified and clarified by logic (formal or demonstrative logic), which is the theory of demonstrative reasoning. The standards of plausible reasoning are fluid, and there is no theory of such reasoning that could be compared to demonstrative logic in clarity or would command comparable consensus.[116] G. Polya, *Induction and Analogy in Mathematics* (Vol. 1 of Mathematics and Plausible Reasoning, 1954, Princeton.)

Line" as a single value point. But when we introduce the term *need* as a way to speak of a *function of entailment,* we have truly entered the realm of economics.

The opening salvo of Carl Menger's *Principles of Economics*[117] is found in the fourth paragraph of the first chapter entitled "The General Theory of the Good," and proceeds as follows:

> If a thing is to become a good, or in other words, if it is to acquire goods-character, all four of the following prerequisites must be simultaneously present:
>
>> 1. A human need.
>>
>> 2. Such properties as render the thing capable of being brought into a causal connection with the satisfaction of this need.
>>
>> 3. Human knowledge of this causal connection.
>>
>> 4. Command of the thing sufficient to direct it to the satisfaction of the need.
>
> Only when all four of these prerequisistes are present simultaneously can a thng become a good. When even one of them is absent, a thing cannot acquire goods-character, and a thing already possessing goods-character would lose it at once if but one of the four prerequisites ceased to be present."

Menger is known as the founder of the Austrian School of Economics, and best remembered for having solved the riddle of value with what is known as "the marginal utility theory of value" in the very same year as Stanley Jevons solved it in England, and Leon Walrus solved it in Sweden. This was a coincidence whose legacy still roils economic thought, since Menger solved it using the above definition of "goods," while Jevons and Walrus solved it using the idea of "scarcity."

I will include his answer to the conundrum of *valuation* only to emphasize the extent to which economic tools will have in our later attempts to grasp the play and strategies of "punctuation." The connection which economic analysis has to the logic of complexity runs deep. I hope to show in the volume following on this one, *The Work of Emotion,* that the driving social and political forces that pushed economics to center stage, and created its whole universe of analysis will play a key role of foil to our development of the logic of ONE and its permutations. Economics deals with choices, strategies, and means of measuring effectiveness. This is critical to our understanding of work, as well as the fuzzy but extremely critical world of emotions.

Menger never used the term "marginal utility" but described the analysis of value in a more qualified, if obscure fashion:

> "The importance which concrete goods, or quantities of goods, receive for us from the fact that we are conscious of being dependent on our disposal over them for the satisfaction of our wants," and (he) describes the magnitude of this value as equal to the importance which attached to the least important satisfaction which is secured by a single unit of the available quantity of the commodity."[118]

The next chapter takes another tack on the idea of *pointing* –considered from the standpoint of indexing and retrieval—developing pointing into the idea of *pointing systems*, and from there, rather iconoclastically into the idea of *folding, and occlusions.* This can be directly tied to James' ideas of strong theory of pluralism that we have so far followed from his earliest academic arguments that concerned the maintenance and management of multiple belief sets. The focus, while still surveying the possible meaning of punctuation considered as a *punct* (eg. "point") brings us to a point where in the chapter that follows, we can consider the the word and its context of use <u>as a pointer to a specific index</u>, where the "index" is now the language of discourse. With the second part of this book having made a full circle back to the idea of the formation of a specific concept and its meaning (from the flux), this book ends. *The*

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[117] Carl Menger (1840-1921), *Grundsätze der Vokswirtschaftalehre,* 1871. English translation, No.17 in the London School of Economics' *series of Reprints of Scarce Works in Economics and Political Science,* 1932. The edition used here printed 1994, Libertairan Press, Inc., reprint of edition by the Institute for Humane Studies, 1978
[118] this quote is from Friedrich Hayek's *Introduction* to the first English edition, p.

Work of Emotion takes up the issue of *mechanisms,* and how the logical framework developed in this section that answers to a Jamesian ontology (or what I argue as being a Jamesian ontology), could work. For there must be criteria by which we measure one choice as being preferable to another, and such a measure depends on a sense of order. Of course, the deeper problem of philosophy is the the discernment, and testing, of order…which we are attempting here to demonstrate is not a *single order at all,* but rather artifacts of the entailments of the permutations of ONE. The claim that I'm developing here is that this discernment and testing of *orders* will be the core process driving complexity, but that the testing must always return us (any active agent) to that same plentiful ONE which ever remains ideal for the active agent of our minds.

Thickness Solved

Potential Density of Coincidences: 'Coincidensity'

In the summary of the chapter on *density*, I concluded that [density] was ambiguous, but masqueraded as highly technical terminology, and suggested a parent from which all the various concepts of density might spring, to exist as a family of siblings. I introduced the term 'coincidensity' at that time to resolve the issue, and held off in providing a full explanation of what *coincidensity* might mean, except that it was a portmanteau of 'coincidence' and 'density.'

Now that we have clarified our notion of 'coincidence' in relation to the idea of 'independence' there should be little to stop us at this point from completing the definition of the parent of all those various densities. *Coincidensity* is, for now, simply a term used to describe a class of density measures to be used to indicate coincidence across a spatial /temporal frame.

James' "thickness" refers to the potential coincidensity of language that is available in a given universe of discourse.

9. Comfort in Chaos

Punctuation is explored and expanded to include indexes, allowing any singular pointing to reference an entire structure. Fairthorne's work on indexing is discussed through the history of modern Information Technology, where the thesaurus structure index can be used to toggle between universes of discourse.

Chaotic Relativity

On a very human level, chaos is relative. My friend Peter's house was literally filled waste high with piles of books, and shoulder-high where there were tables for extra stability. He had paths between them, from the kitchen table to the steps in the front room, and the paths branched out to windows and bookcases and tables throughout the house. All of this was catalogued in Peter's head—down to the approximate pages of footnotes in the books, so that if he wanted to reference something or check a quote he would proceed shifting piles around to get the book somewhere around his knees midway into the dining room. To Peter it was a well-ordered and dynamic puzzle, much like he assumed the rest of the world was. But the only sense of order one could glean from all this was that both his bathrooms were reserved for Science Fiction.

My friend Cal had a similar method for storing all the doodads and obscure graphics for his found art. His first floor was Flea Market Essentials & Co.— 1950's Popular Science magazines, lithograph illustrations from the 1876 Worlds' Fair, a box of Famers' Almanacs from the 1920's, Merchant Marine and Cub Scout manuals, ads from assorted 1960's *Homes and Gardens* magazine, shoeboxes of assorted buttons and stamps or cigarbox labels. This chaos was a bit more three-dimensional and went much higher than Peter's (but like Peter's extended from the front door to the kitchen table); his television set sat above the refrigerator. Cal only vaguely needed to remember where he put anything, because whenever he looked he'd be continually surprized at what he discovered that would serve just as well, if not better. Upstairs was quite different, packed with finished artwork and production materials—vertically stacked on plywood shelving. Cal was always Zen-calm, upbeat and productive in the very image of his art, which was a carefully rendered image of his world-view. His pieces still adorn the album covers of "Mothers of Invention," which have themselves joined the category of flea market essentials.

Cal's chaos was clearly functional. Whenever he was searching for 'just the right visual' for his brand of graphic collage, before ten minutes went by he'd have been creatively reminded of exactly what he was looking for. The question of organizing or indexing it was moot. A rough memory generally guided him to the right corner of the room, and if he didn't find what he was looking for, what he found generally changed his needs.

Peter on the other hand had a brain capable of indexing everything he'd ever read. He was not an idiot-savant who could riffle through a Miami phone-book with photographic recall. Hardly. Peter read books nearly at the speed of the idiot-savant but put them together into a whole. He could recount Samuel Pepys'misadventures, or compare Gibbons' Rome to Robert Graves' version, and Marx's economics to Mill's. But Peter was a mathematician—he had piles of journals containing proofs and equations as well, and could discuss *their relationships* to one another. Far better than a Google search, when you queried Peter what he returned was ordered by relevancy, which is quite relevant to our discussion of chaos, for Peter's *mind* added something that no indexing system has ever succeeded in providing.

He was an antiquarian of Portuguese naval maps, sat on the board and handled legal affairs for an international medical research organization and had been downloading the New York Times in DOS before the introduction of Windows, complaining that there were too many best sellers when he could hardly keep up with the rate of major academic publications!

His was a phenomenon of knowledge, whose only purpose seemed be to satisfy an immense intellectual curiosity, as if nothing one did or said seemed to matter much in the end. His immense and valuable library, funded by his family's wallpaper fortune, was indexed in his mind; while his pile-accessing-protocol was more space-and-time saving than any library bookshelf setup would have been in his little Princeton rowhouse. Obviously better than a Google search, he could usually back up his memory under five minutes of physical retrieval—where you now had the entire book, and its index at your disposal.

Both Peter and Cal's homes had evolved into well-ordered functions of their lives. Were any other set of organizing priorities brought into play—such as those of a partner—the overwhelming chaos would have become unbearably evident.[119]

To the opposite extreme, I had a professor who, during an obsessive quirk of humorous frustration with someone or another sharing the house, had put large printed library labels on every doorway with the category of the room, with similar labels on every shelf and closet and drawer in the house. In plain English and not the Dewey Decimal System.

Turning to *my* house, my wife is extremely consistent and as well-organized as Peter. She knows exactly where she puts everything—it matters not where, she can find it. But if I should arrange all the canned goods on one shelf, by type, or place all the vegetables in the vegetable drawer she will not find them. It is I who is bringing down chaos on us all! This is to say that *ideosyncracy* has a special meaning when it comes to what is chaotic and what is not.

I am drawing an analogy between chaos and information recall, and I shall turn our attention to the inherent problems of library protocols. It has been quite forgotten that librarians were the information specialists that helped conceptualize the world of high-speed information handling that led to the current internet web, or 'cloud.'

Indexing Solutions

I have often met individuals who keep very precise handwritten journals in this day of smartphones. They will pull out a little hardcover pocket writing book and note in extra small print the times and locations and topics of any pertinent conversation. They, or anyone else with these numbered journals can retrieve the topic of any conversation by time-of-day-month-and-year, Whether they are cross-indexed by topic I do not know. The ordering principle is linear time. Should it become necessary to recreate pieces of their past life, to cross-check one's current position relevant to an earlier time, analyze one's spiritual growth, or defend oneself in court sometime in the vague and uncertain future, these journals will definitely serve this function.

My journals, on the other hand, fall somewhere in-between my friends' and Cal's house. I write in them at random, opening them anywhere—upside-down or sideways, adding drawings, quotes and quips along with bad puns, and these along with essays and traditional journal entries. I number the odd pages and before retiring a book generally create an index of relevant descriptors somewhere or another, dog-earing it if the only empty page for it is in the middle of the notebook. The linearity of pages is entirely irrelevant in these chaotic bundles of paper—because as long as they remained *bound into a little volume*, they are by definition "pre-organized." All that is needed for recall is numbered pages and an easily retrievable index, anywhere.

So, for example, if I am writing merrily along in a half-filled notebook (having begun on any empty page), and run into a drawing, meeting notes, recipes or music notation, I simply do what magazines did in the olden days—print 'cont'd on p.xx' at the bottom …and if the pages weren't numbered yet, I only needed to leave it blank until they were, for when I am retiring the journal and creating the index, I will usually find the missing reference and fill it in.

I learned this deplorable method from my involvement with old computer storage—for as you created and deleted documents over a period of months and years, the available memory got broken up into hundreds of short pieces, and to save a large document or graphic or video there would be no contiguous open storage, so it would be broken into pieces and semi-indexed at the beginning and end of each fragment, with a summary of the total size at the beginning and end of the file. Over time the indexes start taking up space and weighing down processing speed—so it became normal procedure every year or so to 'defrag' (de-fragment) your computer; juggling and shuffling everything up for a few hours until all the documents and program files were put together in linear form…suddenly opening up large swaths of available memory because all thousands of cross-indexes had been deleted. It is not generally a problem for computers today, when processing power and storage capacity far exceeds the loads most common

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[119] Cal did share the house with his father, who had an immaculately ordered room…but for the rest of the house his dad was devoted to his son's methodology, which brought him a living and some fame.

usages put on the processor; of course downloading videos while they are playing is still breaking the file up into hundreds of indexed fragments….which is why videos can go slow and burp now and then.

Yet this description of storage and recall in your processing unit (whether smartphone or laptop) counts as *nothing* compared to what is taking place at the byte-stream/packet level, as your Wi-Fi is picking up that video on a particular frequency, while reassembling a transmission originating from a server in Vancouver or Singapore….some of it coming to you via Houston, some through Chicago, Montreal, Toronto, Pittsburgh and Charlotte. In other words, every byte in the file has an identifier that confirms what file it belongs to, waiting around to connect to the next matching piece of data, reassembling the puzzle *from the chaos of all the other WIFI streams within range*—into its prescribed linear form.

You needn't worry about the statistical immensity of this problem because electrons travel at about the same speed as photons, or the speed of light. If they travelled only at the speed of sound we'd have a big problem coordinating packets of data through all those servers between you and Vancouver, even given all the redundant backup signal streams in the process.

What I am getting at is the fact that all the information that you or I indulge in through the internet is *built* with self-contained indexes. Without indexing there is no information, i.e., nothing. Files are not just several million 'bytes' composed of on/off BITS of content in a linear document under the name of the file, but come in packets that represent and contain a specific 'communications protocol.' It is a file that can be located in a space (or multiple fragments of memory in your storage) *only given this dynamic* protocol—which, as you see, is actually *layers of protocol,* for the way the file is organized for your processor is quite a different thing than the protocol that *delivers* it to you. And without the indexes for these protocols it hardly can be said to constitute ANYTHING BUT chaos; packets of bytes flying around out there without a communications protocol attached are *functionally nothing*...e.g. part of the immensity of the Void.[120]

Now it will be a big surprise to know that these protocols were actually invented by librarians…or at least professionals who were educated in the art of libraries and information storage and recall. When the concepts of 'data' were being developed in the earliest days of punch-cards and transisters, it was clearly understood that these rules underlying data structures would eventually have to handle information in the loads we now consider normal, and with a proclivity that exceeded anything that purpose but a few pioneers could envision at the time, which was essentially from the 1940's through the 1960's.

The parallels between Peter and Cal's organizing principles and my analogy to the 'chaos' of n-numerable information packets flying between microwave towers may seem somewhat tenuous because it is relying on our concept of "organizing principles." In the example of raw data being turned into infomration by your receiver, we assume the intricate layers of chips, each doing their thing—which is receiving, picking and choosing and sorting outputs to the next layers of protocols/chips/programs. In Cal's collection of potential visual 'data' and Peter's representative collection of the English-speaking world's intellectual information we may not see a clear parallel. Theirs is merely crude chaos—at least for anyone unfamiliar with their ideosyncratic mental protocols for retrieval, how they use the mess they've made of their living quarters.

Now there is another analogy that more clearly identifies our current concept of "chaos" (as a space or process being governed by multiple conflicting principles or orders) and that is a city dump or an auto graveyard. Both of which are clearly 'chaotic' until you find people to pick through them for items they have a use for recycling—and the computer-controlled sorting technologies at a recycling facility are clearly intended for a very specific kind of chaos.

Here we are only solidifying the claim that this is all we mean by the term "chaos"—an inability to sort things out with the ruls at our disposal. So even though the microwave 'information' is, prior to its conversion, invisible to us with a properly programmed receiver, I believe it is quite parallel to our notion of "the flux," and what happens to all the microwave frequencies travelling off in all directions from our earth is quite parallel to our consideration of their entering "the void." They are for all intents and

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[120] Without the indexing protocol attached there are still physical microwave frequencies 'out there.' But it is like speaking of the gravitational forces that are 'out there' between you and the nearest star beyond our own solar system, only the computer information cannot be equated with a force of Nature---just lost and lonesome packets going on and on forever with no function and no home.

purposes, dead…yet still existing in the realm of physics as clouds of static interference that must be filtered out in the work of astrophysicists.

The point becomes trivial in many ways. We all know what it means for electronic packets to be converted to Twitter messages or what it means for my friend Cal to find the graphics he needs to construct a collage. Can this simply be described as "turning raw data into information"…where information is "data in its functional context?" This is another way of describing the attempt to assemble 'stuff' from the flux of chaos, turning percepts into concepts, i.e. "useful information." We haven't gotten anywhere. We want the *method being used* to carry out this process, not simply to be given another name for the process!

This is problematic because we sort according to potential usages, and each of our uses is ideosyncratic—that is, unique to each of us. We all are governed by these many multiple sorting protocols, which themselves loop back to whatever is multiple (ideosyncratic) governing principle, each with *its own* sense of order. To begin distinguishing strategies for sorting, and ultimately *categories of sorting,* we are brought back to that question—[what constitute the structural characteristics of "order"?].

Well-Ordered Purpose

Can one even ask the question as to the constituents of <u>order *itself*</u>? Mustn't the answer recursively include some particular idea of order that created our answer??

Having provided you almost a hundred pages to think over the multitudinous list of dictionary definitions in the earlier footnote (ftnt 37, p.35), I will jump to my conclusion that the recursiveness of the problem of defining 'order' is due to those two parallel definitions that led us to it—for just as the concept of *information* and *function* rely on a definition of the deep structure of *order,* 'order' will turn out relying on them. Our present (or at least original) purpose was to track down the idea of 'chaos'—so the underlying constituents of what opposes the chaotic is open to conjecture. But by tying the problem of 'order' to *information and function* brings us right into the middle of issues the infant information science had to struggle with when they were creating conventions (the organizing principles of order) for data storage and data transmission. **It is a problem of the *shape* (i.e. all potential shapes) of information itself—of what constitutes the end-game of any raw data you might happen to choose.**

Data in a well-structured database is one thing, as well as in a library (another well-structured database)—but Cal's living room is not a well-structured database, even though it *is structured enough* for Cal. But the same argument applies to all the "data" represented by a city, or an ecology-in-the-raw. Extrapolating this to the world at large, or even *to existence in general* we would have "raw data" that could be called our 'data-base' if we had an appropriate filter/capture/ storage&sorting mechanism.

And we've seen that the question of "what is information?" is tangent to "what is function?" The two questions touch, and feed one another—though they are not the same question. *Our* question, on the other hand, seemed broader—for in dissecting 'chaos' we've been looking for its opposing counterpart in a notion of 'ordering principles.' The previous discussion shows that it is simply another tangent.

Given *this* conclusion we ought to be able to triangulate the three questions.

Since we know for a fact that Information Science has solved their piece of the problem for most purposes,[121] we can begin, again here, to get a handle on 'chaos.'

Memory and Well-Ordered Indexes

I began my professional career in the training department of a multi-national engineering and construction firm; my local office focussed on the nuclear power industry, but would occasionally bid on jobs in other areas of corporate expertise, such as chemical plant upgrades, railway or dock facility modifications, etc. Corporate education is generally focussed around instructional systems that pass along the standard operating procedures, though luckily in our case it included general education in the latest research and tools. My interest was directed to the value of methdologies that would collect and pass on

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[121] I qualify this as *most purposes*, for IT has never been able to create a data model for events (action film clips, sports databases) that can distinguish event types without a database 'key'-word search. There turn out to be many reasons to compare events that do not share key descriptors—which return far too many event (video) sequences for a given descriptor with no good way to narrow the search. My goal, which led to the present work, was to develop a save-and-store method around an "event grammar," that allowed data search by event structure or comparative composition; much of this discussion is included in book three, *The Pacioli Principle: a Logic of Simultaneity.*

technical experience from our own specialist engineers around the world, actually cutting the edge of many new tools and materials (e.g. technologies) before publication, to our own local staff designers and engineers. I became exceedingly interested in the nature of bread&butter "training" on S.O.P.s (standard operating procedures), and the ways in which they were promulgated and changed—for this is essentially the core of a company's "wisdom," its heuristics and rules of thumb, its "ingrained habits" that can be so difficult to change (like personal habits). In short, I became a Hobbesian-in-miniature, looking at a business enterprise as a stretched-out model of the individuals who comprised it. The goal of any good creative spirit in its midst, such as I, was to get it to work like a creative individual![122]

I developed what I called the "Video Debriefer," which collected video stories about jobs through an interactive series of online prompts that were meant to capture the broadest possible features of job know-how on video—a video memory-bank of "Standard Operating Rules-of-Thumb," heuristics that could be queried by staff around the company. I developed the underlying specifications for the hardware and gave several papers on the idea. It raised quite a bit of interest, as "corporate memory systems" had yet to be marketed by the now-iconic names invading the desktop market.[123] I was specifically encouraged by the Library of Congress to do post-graduate work on information theory in library science—a connection I would never have considered previously. It was here that my studies in learning theory coalesced with the research in ancient and future library systems. But this connection should have been obvious all along: we are simply dealing with another theoretical construct for *memory*.

For anyone concerned with such "theoretical constructs for memory," a story from the anals of industry becomes quite relevant. It seems that at the very outset of the computer industry, when the first chips were being designed, Apple conceived of a way to consider storage instructions and process instructions *as one-and-the-same procedure*. This was a very savvy move, for it cut down the processing and transmission requirements on their systems, allowing (at least) one fewer input/output channel to their chips than the traditional model. This allowed Apple computers to handle larger information loads—such as colored screen graphics—than their competition at a time when every additional kilobyte of information lowered the system's processing speed. Their early capture of the graphic arts' and printing industries allowed them to stay solvent through the advance of IBM's DOS, and later Microsoft-based operating systems, until another challenge in chip processing power with the onset of smartphones over laptops, allowed them to leapfrog over the competition with their I-phone.[124] This story, which is *not* apocryphal, begins at the top of a treasury of modern folklore of education, as an argument against those who contend philosophy has no direct application to making money!

Indexes as Structure & Function

The difference between Apple and IBM/MS *philosophies* of memory directly impacted their operating systems. In the context of our current discussion, these represent *governing principles,* or *systems of organization.* My argument is that this is directly related to a physical structure –and the example, by analogy, says that while the actual results of physical operations may be the same (producing similar screen displays) the governing principles are incommensurable. Back in the day, you could not load an Apple game or word-processing program onto an IBM PC—and while the differences are transparent today, when higher-order internet protocols (based on HTML ordering principles) govern transmission and display.

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[122] I failed miserably, as I describe in *The Pacioli Principle.* Unbeknowst to us in the trenches, it would be one of the first companies to go belly-up (just prior to Enron) due to creative accounting practices covering losses in its heavy nuclear investment after Three-Mile Island and Chernobyl killed nuclear power.

[123] This was, needless to say, before desktop computers would revolutionize the workplace, "making SOPs a thing of the past": as decision-making in the office could now be relegated to programmable artificial intelligence directly accessible at every desk and counter in the workplace! There was no interest in my angle of research once these ill-founded hopes took over—while the theoretical justifications for those hopes is still not grasped, and billions is still being invested in similar assaults to improve computerized decision-making and give the world faith in the wisdom of the world's programmers.

[124] I learned about this in the field, *after* getting my degree in IT while developing training SOPs for the manufacture of silicon chip "packaging" at NSA. When a fragile piece of silicon has been cut from its mother-wafer, the inputs and outputs to its miniature circuitry—which nowadays number in the many hundreds—must be connected and inserted onto a plastic piece, its "package" that has prongs or easily-made contacts that can be inserted and changed out by human hands (or a robot). In the earliest days of chip-making, which an old-timer from Sarnoff Labs recounted to me, when wafers were the size and thickness of records and chips could be handled by human hands, there were only a few such I/Os to worry about—you could actually count them and recognize which were input and which output.

I shall now step back in history to the days in which computer coding was first conceived. As I mentioned before, it was under the auspices of library scientists who had originally developed complex punch-card systems for the indexing and retrieval of masses of scientific information that had suddenly begun overloading industrial and government libraries between the two World Wars. These same punch-card systems had been automated, in rudimentary reading and sorting technologies—the forerunners of mechanical computers—long before ENIAC, the first functional electronic computer. It was therefore not a big leap to consider punched cards as the way to communicate instructions to a machine. The original punched card systems were used, exactly like the cards in a library card catalog, however, they had indexing—ie digital--information keys (locations that could be punched with a hole or left nul) around all four corners of the card, with hand-written descriptive text in its normal place on the card. Scientists could place a research query to the central library, who would use a simple mechanical device to sort out the cards with all the apprpriate holes. The texts on the physical cards were on microfilm, allowing the scientist at a remote location to review the search results before ordering relevant paper to be copied or sent from the central library.

Card punching systems and their associated mechanical sorting hardware were highly ideosyncratic to various industries and research areas—and an entire literature grew up around the efficiencies of various systems by which to lay out research topic indexes for retrieval. This is, then, the background picture needed to make the conceptual leap to modern information theory. The jump from from organizational chaos of Cal's garage (which went a step beyond the living room) to the thought processes it took to create the original byte-structures in ASCII, the first nesting of command structures in HTML[125] is a long-jump, but doable.

The hardest piece of this is to recognize that indexing *systems*, which are at their heart the physical instance of a *conceptual classification system* are themselves the functional representation of order, *Order-in-the-large*.

Neither Peter nor Cal had physical indexes of the data, artifactual collections, in their homes. The entire collecting and storing and retrieval apparatus was in their respective minds. The immense problem which confronted scientific librarians was how to model such ideosyncratic minds in-the-large, creating a socially functional repository that could double as a *generic* creative mind. If you consider they needed a way to take the most highly complex conceptual structures of research science—gigantic national and international data dumps at the forefront of creative knowledge, where the eventual uses and impacts of the research could not be predicted, and create an indexing structure that physically represented this burgeoning ever-growing morass of essentially pure data—some of it to be connected and turned into useful information, some of it to left on a siding and probably lost. And this is the creative problem that confronted information science in its infancy. One should notice the parallels to Polya's arguments concerning the art of logic and plausible reasoning, for the issues driving the *objectives* and *purposes* of the infant information science were not yet at the point where ASCII or HTML were anyone's concern—and yet those moments of conception had to recognize every bit of their potential constraints looking only at the core…essentially designing the DNA in its seed. My guess is that, given this DNA served far beyond infancy into its teens and technological adulthood, that there is something to be taken from the DNA structure. For again we have James' problem taken from a different angle, allowing raw data (percepts) to be turned into information (concepts).

Library indexing structures

R.A.Fairthorne was one of those researchers at the forefront of the efforts I described to build the first scientific information-handling systems. He got his start tackling aeronautical research for the RAF in World War II, and was thrown into the midst of the post-war theory leading to the days of computerization. His papers are collected in a little volume entitled *Towards Information Retrieval* (Butterworth & Co., 1961), which get at the core theoretical issues underlying the problems described in

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[125] HTML (High-level Text Markup Language) is familiar to us as the structure of internet screens when you right-click "display code". It is an exemplar of "nesting structures" since each component command is indented to the level of its sibling commands, all of which define the graphic (and textual) layout on a web screen. It originated, *in all its complexity,* as the most efficient way to transmit text and page reproduction instructions to the first IBM mainframe systems, in order to create human readable reports. XTML is its modern higher-level parent, an interesting case where the parent was born from its multiple children, of which HTML was the eldest.

the previous section. I do not know of any direct part he played in the formalization of computer language protocols, but am extrapolating the theoretical work presented in this little volume (published during those years between the war and its publication in 1961) to the discussions within the information system industry as a whole.

One of the intellectual battles being fought, for example, was over the use of Boolean algebraic procedures versus Lattice algebras[126]—where Fairthorne argues for the latter, showing the inadequacy of Boolean-based searches. The construction of rules for making non-contracitory decisions about relevance is a typical problem for the librarian—both in the assignment of indexing terms and the options allowed for query and retrieval. He breaks down the issues of physical retrieval as optimization techniques between 'marking' and 'parking' one's data.

Classification is treated as an auxiliary language in which *all items that answer the same question* are given the same name or mark—which on the index card model would be a punched hole. Any document, considered as non-indexed data, could answer many different questions and would obtain many different *digital* marks. The industry or area of scientific research, however, would determine relevant questions—laying out the classification scheme around the four corners of the card, which each physical location for a digital mark (or hole) represented a question.

As Fairthorne's old papers are not generally accessible, this section a number of lengthy exemplary quotes. Not only does this give a feel for the infant science, but Fairthorne argues many of William James' positions concerning the creation of information, and applies it to its management. The following quotes make their own case, confirming the impression that the founders of the IT revolution were themselves "harnessing chaos."

> "A good classification will have a basic vocabulary of subjects with very general and rich implications (a linguistic example is the word 'living', which has at least 30 distinct meanings according to context), and rules of combination and cross-reference that permit building up more general or more specialized meanings. The major syntactical rules […] are inclusion, conjunction, and inclusive disjunction. These, together with a rich vocabulary based on actual historical development, are certainly adequate, though it may be possible to improve on the syntactical rules to suit mechanized handling."(Ibid., p.10) [127]

> "…. classification is the equivalent to searching and rejecting most of the references at an infinite speed.

> "This language of class marks has a syntax governing their combinations so that these bear some relation to the queries that may be asked and the action needed to answer them. There are, therefore, three aspects to consider; the relations between the marks and the queries they represent, the problem of semantics; the relations between the marks themselves, which is syntax; and the effects of the marks on the people who use them, which is pragmatics. […] amongst the formal problems of pragmatics are the physical arrangements of the references, the priority to be given to various symbols, and the alternative methods of arrangement, all within the object of answering questions before they are asked.

> "Socially the most important application of mathematics to classification is as a tool in the field of semantics. Few realize that a good classification system, used by competent people, can provide a telescope through which technicological and cultural developments can be observed before they become explicit. (Ibid., p.2)[128]

> "If letters and their order were, in any sense, meaningless they might still have the same measure of complication. This is fair enough; it merely gives numerical support to the painful truth that it is as difficult and expensive to publish rubbish as anything else.

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[126] Specifically, the use of NOT in traditional Boolean systems was deemed unacceptable. Fairthorne looked to the logic developed by Brouwer, instead, arguing for looser set criteria, such that *meets* and *joins* could be uniquely specified.

[127] "The Mathematics of Classification" in *The Proceedings of the British Society for International Bibliography,* **9,** 4 (1947) p. 35.

[128] "The Mathematics of Classification (1947).

"[such] numerical information is about the signals, not about what they stand for. In medieval terms, it is about form, not substance; in modern terms, it is syntactic, not semantic. According to this measure *Jabberwocky,* which can be communicated only by signals of considerable complexity, is far more informative than a conventional text of the same length. So it is because, by introducing words hitherto unknown, it give information about the way in which things are talked about. Not about what, if anything, the things are.* [* 'Suppose someone to assert: "The gostak distims the doshes". You do not know what this means, nor do I. But if we assume that it is English, we know that "the doshes are distimmed by the gostak". We know too that "one distimmer of doshes is a gostak". If, moreover, the "doshes" are "galloons", we know that "some galloons are distimmed by the gostak". And so we may go on, and so we often do go on." Quoted by Ogden and Richards, *The meaning of meaning.*] Ibid., p.24.[129]

"Complication is no guarantee of information, but information guarantees complication." (Ibid., p.23)[130]

The connections implied between syntax and semantics in the example of otherwise 'meaningless' words combined in a recognizable rule-governed fashion (the syntax) introduce the problem solved by connection methods of lattice algebra.

"Lattice algebra, so far as it is needed in the present context, is not a particularly difficult discipline. Unfortunately most expositions assume a mathematically sophisiticated reader. […] How do you arrange that, if some links of one chain are missing, you can join up with links from the other system without upsetting anything when the missing descriptive data is available? The problem is that of two mazes on top on each other, arranged so that if one is blocked locally you can descend through a trapdoor to the alternative maze and bob up again later in a place that would have been on your route, even if you had made no detour." (Ibid., p.27)[131]

"In general, the number of patterns that can be made from n properties and their distinct complements (the property of not having that property) is the nth power of two and, inversely, knowledge of n correct 'yes-or-no' replies to properly chosen questions will identify one out of 2^n objects. For example, twenty such questions can pick out one item from one million forty-eight thousand five hundred and seventy-six. When each of the names is as likely to occur as another, n is what communication engineers call the 'information' given by the name or signal. [….] (Ibid.,p.24)

"Primarily coding represents all possible distinct messages, within a sharply defined context, as physical patterns." (Ibid., p.28)[132]

He then introduces the primary constraint to efficient coding as being the almost natural creation of synonyms, for synonymous relations imply substitutability of near-equivalences. It is here, of course, that the structures of the Tropes *might be* directly introduced, becoming key variables to a rather new type of index structure. The question becomes, what type of structure is it—for with these new options for mapping 'equivalence relations,' it suddenly becomes obesely large and unmanageable.

Reading Fairthorne will not take you to the origins of digital system structures, which I may have implied in my previous section. He is relevant to our discussion because his primary concern is the same as ours—for his principal construct in Information Theory is essentially Jamesian (just as Claude

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[129] "Information Theory and Clerical Systems" in *Journal of Documentation* **9** 2 (1953) p. 101

[130] "Information Theory and Clerical Systems" 1953

[131] Information lattices are usually non-modular and often non-distributive. The belief that they are invariably Boolean is based solely on the trusting nature of electronic engineers." his ftnote., Idem.

[132] "Information Theory and Clerical Systems." 1953. The same quote is found in B.C.Vickery *On Retrieval System Theory* (Butterworth, 1961. p. 92), where he expands Fairthorne's discussion of coding theory, so as to develop the mathematics for the most efficient code strings—which he applies directly to the issue of binary (punch card) code strings

Shannon's 'entropy' is Jamesian) as the science of creating information by reducing *noise*. The origins of IT are directly traceable to pressing needs to understand the nature of noise-reduction, which might just be another way of saying "harnessing chaos," for it demands a way to distinguish what is chaotic in order to filter it out. This is not the place to retrace the many technical avenues taken for noise reduction in electronic transmissions, but the librarian—besides being the seminal worker in the social work of information handling—must deal with the second-order problem of 'noise' in the *description of information.*

The theory of search queries that Fairthorne is struggling with in the history of classification logics is easily and intuitively connected to the modern situation Google finds itself in, developing abstruse mathematics to handle the logorithmic immensities of permutative connections across the web—for advertising revenues drive the creation of tools to target potential audiences according to search histories from their IP address. Yet this is a far cry from my implications that this discussion had something to do with the deep structure of digital codes and nascent programming techniques and the evolution of specific languages underlying particular hardware 'platforms' (where the simplest programmable logic controller- or PLC running an automated oven is considered a 'platform') and their software. I am making that claim. The parameters of uses to which information technologies would be put were already well-known in the discussions leading to the specification of the very first hardware systems—even where lone inventors such as Steve Gates contributed meaningful solutions to questions they themselves had not raised, and may not have even grasped at the time. Fairthorne's angle on the early problems of Information Science is highly instructive—even though Boolean logics may have won out in the industry thus far. The creation of the classification logic that could be applied to unique fields of knowledge to support the most direct and efficient, e.g. *automatable,* search strategies is parallel to a search for the parameters of information defined-in-the-large, *of information itself* as opposed to raw data that is only noise in the plenum.

> "…for the communication engineer has different interests. In particular he is not concerned with completed messages, but how to deal with bits of them during the course of communication. He cannot do much to alter the temporal order of these bits, because this implies storage and storage implies delay, and delay is what communication engineers are paid to fight. We, on the other hand, deal with spatial collections of completed messages and, after recognition or identification, questions of their ordering and disordering predominate. Finally, the communication engineer has a much narrower semantics, which refers only to the statistical properties of the language of the message, not to its sense or seemliness." (Ibid.p.65)[133]

> "The function of telegraphy is to inform the receiver which particular message has been handed in at the transmitter. It is not concerned with any information that may be interpreted within the message itself.

> "[…] It is no new discovery that the intermediate stages of communication can be stripped down to purely physical processes whose 'meaning' is covered by the rules for their use. […] designers of typewriters are not necessarily expert in the writing of English,….conversely, designers of deep semantic systems must not dispose lightly of the physical problems raised by the clerical machinery inseparable from their use." (Idem.)

Fairthorne's reference to 'designers of deep semantic systems' is directly aimed at those engineering workers in the field (at Univac and elsewhere) designing the binary codes for their companies' first computers.

> "those who fear automatism as a threat to creative work can be reassured. Remote control in space—telegraph, radio, strings, and levers—in no way threatens creative work; far from it. Automatism is merely remote control in time."[134] (Ibid., 93)

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[133] from "The Theory of Communication" *ASLIB Proceedings* **6, 4 (1954) p.65.**
[134] "The Patterns of retrieval" *Amer. Docum.7,2* (1956) p.65.

A Thesaurus as an Index for Toggling between Unrelated Disciplines

Thesaurus-like catalogs are relatively loose sorting structures based around some conventional word-based understanding. Roget's original *Thesaurus,* for example, first declared a set of logical categories or hierarchical ordering of attributes of the universe as the English language (i.e. the convention in consideration) expressed it. All words that could be used to describe that attribute were listed, sorted by similarity, and assigned a consecutive number (that is, an easily locatable token with no special order or meaning attached). Each of these words were then cross-indexed in an alphabetized list with all categories and associated tokens attached. It is the use to which a thesaurus can be put that is of most interest. The types and their uses are left unspecified.

> "…the elements of the thesaurus description are not normal linguistic words or phrases, because ordinary language is not made for loose statements of controlled imprecision. The elements are the clusters of words in a thesaurus corresponding to the clusters of texts answering to a given element of description. The words will vary from language to language but the clusters of texts will be the same, within limits that can be measured in terms of the 'set distance' introduced above. Because these elements of description are imprecise, precision being derived from their joint occurrence, they can be assigned without much ambiguity or the need for much skill. […] Chemical indexes have been simplified by thesaurus groupings based on the figures of rhetoric. […] Thus, we can achieve delegation to the extent of pushing the drudgery on to the compiles of various kinds of thesauri…(Ibid. 133)[135]

Chemical research librarians had adequate organizing principles for their second list, where this second list in Roget's *Thesaurus* was the alphabetical lookup, the second list for the chemist is the Periodic Table. It is, of course more than simply this table, but trivially (and massively) created through potential combinations and permutations of that Periodic Table. What is unclear from Fairthorne's brief reference, is *how the figures of rhetoric are used in moving from the first lookup to the second.*[136]

What should be clear, however, is that the idea of assigning strong toggled relationship structure – providing for a search of hypothetical functionalities—is indeed possible to construct. We need just such a mechanism as we wander into the experiential flux, dealing only in percepts indicating *possible relationships* that must be compared –hypothetically—to previous experiential records, before assigning them a function, i.e. turning them into the parts of a new conceptual unit. And this is precisely what is needed to assign a role to a 'punctuation' as introduced in the previous chapters.

▲ The Order/Information\Function Triangle Δ

At the opening of this chapter, just prior to turning our focus on chaos to the practical problem of specifying the root constituents of order for all computer communications in the birthing of Information Science we suggested that the dictionary definitions of 'order' might depend on two *other* concepts, of information and function. Considering the problem of slowly separating out some dominant organizing principles from a chaotic plethora of activities, being thus able to discern individual components of the chaos, and slowly reducing it to some protocol of interpretation, we took an Informational perspective, from which the idea of a thesaurus was introduced. The thesaurus is a cross-indexing tool that brings together functional similarities in word meanings. The words appear in alphabetical order, which orthographic –by spelling in a certain language—with numerical cross-references to every numbered list of meanings they might be found in. The numbers, too, are themselves meaningless except for their association with other words in any particular edition of the thesaurus. In Roget's original Thesaurus, the numbers were hierarchically organized according to what Dr. Roget considered to be the logical cateogies of all existence. They are very nice categories, but ideosyncratic to Dr. Roget in 1836 or thereabouts. Given that any given word in the alphabetical index might occur in multiple lists, for various meanings or

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[135] "Delegation of Classification" *Amer. Docum.* **9,** 3 (1953) p.59.

[136] Whether this experimental library lookup system survived as the ancestor of any computerized lookups today is moot, except that we should see explicitly where rhetorical figures were utilized in the 'equation' between first and second lookups. I have not pursued any further what is essentially nothing more than an anecdotal reference to an experiment we can be sure took place at some time in the 1950s.

language functions, you might move back and forth between word and numbered indexes several times before you found the word that had the closest meaning or function to what you intended—and if there was nothing to match, you might be free to coin a new word. This is the situation you are in when trying to unravel chaos, to sort out organizing principles in some sort of hierarchy. You are separating out different functions, for which you posit organizing principles… then check them against those you consider similar—and if everything tests out right, assign its information value, or correct word. And for this work, a thesaurus structure can work admirably.

Clearly, *function* is relegated to a variable, and if we know the function we can, with work, create a protocol – a set of rules that allow for a dynamic process of data filtering&gathering, storage&sorting, reporting&analysis and return to continued search. This is what a thesaurus structure should allow, whether you are What is not particularly clear is that these rules imply a structure rather like a grammar or syntax by which rules themselves may be stated (e.g. linearly organized) and it is here that we might look for the protean 'order' to be found in Augustine's Plenum – perhaps what he intuited metaphorically as its "intelligence."

James, if you remember, uses the metaphor of language in describing our most primary semi-conscious interplay with "pure experience." Parts of speech are used to represent the various types of relationships that are being sensed –and it is precisely this that we are after as constituting the process of turning percepts into concepts:

> Prepositions, copulas, and conjunctions, 'is,' 'isn't,' 'then,' 'before,' 'in,' 'on,' 'beside,' 'between, ' 'next,' 'like,' 'unlike,' 'as,' 'but,' flower out of the stream of pure experience, the stream of concretes or the sensational stream, as naturally as nouns and adjectives do…

We are after the rules or strategies for creating concept protocols that our different variables of *function* or *objective purpose* can be plugged into.

James investigated what "practical reality" might mean to us, and concludes,

> " In the relative sense […] reality means simply relation to our emotional and active life. […] In this sense, whatever excites and stimulates our interest is real; whenever an object so appeals to us that we turn to it, accept, it, fill our mind with it, or practically take account of it, so far it is real for us, and we believe it."…   [137]

Yet what he concludes is that what's functional for the psyche is "more allied to the emotions than to anything else."[138]   He turns to the emotions as markers or names that we give our grosser *feelings and experiences,* and so he is merely saying **belief is based upon the data provided by sensory experience.** Now this would hardly be such an extreme claim, except from the perspective of the thesaurus it is like saying the word lookup refers us to a set of numbered lists *of emotional associations!* This flies directly in the face of the intellectual's assertion that their beliefs are based upon logical demonstration, or rationality. James says no. The academic scholar or scientist does not rely on a different thesaurus because they got their degree, they just have more concepts in play in the numbered listings—but these are based on feelings and experience, basd upon the data provided by sensory experience, which is more allied to the emotions than anything else.

And so James will always return to the case of words and conceptual constructs being presented to sensory experience *a s t h e p e r c e p t s . T h o s e c o n c e p t s d r i l l e d i n t o u s i n t h e c l a s s r o o m r e p r e s e n t a s e c o n d l a y e r o f ' s e n s o r y e x p e r i e n c e . '* And from this the audience of listeners or readers is expected to construct a belief. Of course this is the goal of the academic textbook, just as it is the goal of rhetoric…rhetoric that we take to be that of the politician or used car salesman.

So the goal of all *logical* demonstration, including the rational discourse of the preacher or rabbi or imam carried out within an accepted frame of reference, is to interject an entire conceptual framework onto the perceptual, that is, displace percepts with previously constructed concepts derived *directly* from sensory experience.

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[137] Vol.2 *Principles of Psychology*, p.295, reprinted from "The Perception of Reality" in the journal *Mind,* in July 1869.
[138] Ibid., p. 283 (James' italics).

One might then consider the goal of education or political rhetoric (or media advertising) is to add cross-references between the original functional lookup and the primary emotional structure that holds experience together. Indeed, it should appear a rather straightforward issue of 'weighting the dice,' so that given any logical or functional need, there are more references to one's favored lists in the lookup than other.

But it is slightly more complicated—for an individual, facing a choice of which lookups to use, will take the option that most closely relates to the experience they are currently trying to handle. And what James is actually referring to is that our *emotional life itself has a structure* by which we judge the adequacy of one lookup over another. The car salesman, the trial lawyer, or the fluid politician makes their rhetorical flourishes by interlarding any concept (i.e. a subject of belief in them) with allusions to generalized sensory experience… essentially reminding you that belief is ultimately based on your senses, and raw emotions.

The judge and the academic, or even Socrates, must rely on the conceptual wit built into the figures of speech. Yet this is where the arts of rhetoric begin. So that, using our analogy to the thesaurus lookups, where it seems James' claim is that our belief sets are ultimately based on emotional lookups, then perhaps in the figures of speech we might find the same nest-analytical processes that sensory experience seems to use.

James goes on to supply us with another variable, that of *attention,* which he (along with common sense) ties to the notion of *will.* He suggests that our choice of momentary realities are the consequence of outside events triggering and/or directing our attention one way or another, and he lists six types of attention triggers:

> "(1) Coerciveness over attention, or the mere *power* to possess consciousness:
>
> then follow—
>
> (2) Liveliness, or sensible pungency, especially in the way of exciting *pleasure or pain*;
>
> (3) Stimulating effect upon the will, i.e. capacity to arouse active impulses, the more *instinct*ive the better;
>
> (4) Emotional interest, as object of love, dread, admiration, desire, etc.;
>
> (5) Congruity with certain favorite forms of contemplation—unity, simplicity, permanence, and the like;
>
> (6) Independence of other causes, and its own causal importance."[139]

He concludes this list by saying:

> "These characters run into each other. Coerciveness is the result of liveliness or emotional interest. What is lively and interesting stimulates *eo ipso* the will."[140]

James investigates what "practical reality" might mean to us, and concludes,

> " In the relative sense […] reality means simply relation to our emotional and active life. […] In this sense, whatever excites and stimulates our interest is real"[141]

We must hold this thought. James' demonstration definitely represents the basic argument underlying rhetoric. The Greeks essentially invented this artform and taught it as the *art* of logical reasoning. Following James' lead in considering reality (and discerning multiple realities) we turn to the structures underlying rhetoric.

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[139] Ibid., p. 300. (my italics)
[140] Idem.
[141] Ibid., p.295

10. Rhetoric and Index Substitution

McLuhan's use of the term Tropology as the interplay of environments. Index-substitution is proposed for a theory of metaphor and art where words function as indexes. The strategic game of 'interpretive chaos management' is shown to parallel the oldest arguments about rhetoric in classical Greece—e.g. the manipulation of James' discrete 'belief sets.

McLuhan's Topology of the Tropes

The term *tropological* refers to the "logic of the tropes." One might have been introduced to the term in Marshall McLuhan's *From Cliché to Archetype* (1970, Viking), but most likely it is new to your vocabulary. New or not, you should be able to make out its meaning, for it sounds like a "portmanteau" of *topology* in mathematics with the Figures of Speech (the tropes).[142] McLuhan reminds us that in Greek the word *metaphorein* means "interplay of environments."[143] *Topology* is the study of folding, tying, and knotting of manifolds in space, often requiring them to pass through other dimensions in order to achieve their logical definition in conceptual space.

All of McLuhan's works after *the Gutenberg galaxy* (1962) are tropologically built. As the *agent provocateur* of media methodologies (*The Medium is the Massage* (1967)) and Director of the Center for Culture and Technology at the University of Toronto, he began to create scholarly anti-books around environment-swapping. These were experiments of broad associational swaths of experession, created of a crazy-quilt pastiche of swatches—and these were to convey to the reader his view of the world in a non-linear fashion. Needless to say, he imitates the fashion of conversation at a cocktail party of overly-effusive actors and conveys their enthusiasm of discovery with the excitement of drink and possible sex.

The word "tropology" did not originate with McLuhan. It has a long history in medaieval academia, for when scholarly argument was carried out through a mixture of Rhetorical and Dialectical logic inherited from Aristotle, the only way to interpret an earlier academics' texts was through an inversion of those logics used to create them. This, in fact, is the 'Tropology" that Paul Ricoeur tells us led to the eventual destruction and decline of rhetoric.[144] His book, *The Rule of Metaphor,* is from a series of lectures he was invited to give at the University of Toronto, and so it is hardly coincidental that he should take a closer look at the history of the term *tropology,* before McLuhan got hold of it. Ricoeur's book is quite supportive of McLuhan's interpretation. It is ostensibly aimed at understanding "in a new way the very workings of tropes, and, based on this, eventually to restate in new terms the question of the aim and purposeof rhetoric." [145]

McLuhan uses "Tropology" as providing all possible substitution rules for words, phrases, or other pointers to which functional attributes can be attached, which is to cover arguments that are free from linguistic constraints on thought. His books are experiments in communication theory, to the chagrin of the student trying to make sense of McLuhan's vast and continually shifting I-Max perspectives. His insights are made through constant shifts of context, i.e. *the interplay of environments,* that bring on a storm of associations from which little logical pattern can be deduced except that, if you study hard and remain quite open, you can truly live in a wonderland of gestalts, connectivity and meaning. Otherwise, you will remain a slave to the disconnectedness of these experimental scholarly communications.

McLuhan's 'Tropology' becomes newly-minted form of conceptual poetry, quite like Ezra Pound's *Cantos,* which needs secondary texts to explain the vastness of his allusions. He is obviously toying with every possible permutation of a printed book's function in the representation of meaning (not as a physical object).

From the experimental standpoint of the medium of *text,* a method is necessary to unravel the permutational environment-swapping tools that McLuhan has playfully engaged. There can be little doubt that these anti-books are quite analytically constructed, representing a logical toolbox of options to be used

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[142] *A portmanteau* is Lewis Carroll's term for a word made up of two, taken from quite different wordls, that carries both realms of meaning in "its suitcase." (Wordl was in fact a typo, a happy accident in the image of itself – a word in two worlds—and thus a portmanteau)
[143] Ibid., p. 169.
[144] *The Rule of Metaphor. Multi-disciplinary studies of the creation of meaning in language.* U. of Toronto 1977. *La metaphore vive* 1975. Study 2—the Decline of Rhetoric: Tropology.
[145] Ibid. p.45.

across all the media for the transmission of meaning and values, for pleasure, practical communications, education, and behavioral training. Indeed, McLuhan was Director of the Center of Culture and Technology, founded at the beginning of the Information Age. And all this is good reason to reconsider the Rhetorical Art, one of the earliest analytical "sciences" developed in Western culture.

While arguing the importance of studying rhetoric Isocrates long ago warned us of the dangers of the rhetorical art form. One must master the science both to develop new avenues of creative interest and for critique of rhetorical misapplications; rhetoric was a well-known technique for the obfuscation of the truth, the creation of fake news, and the marketing of sleazy services. Plato reminds us of one of the great orators of the time, the wealthy Gorgias, who advertized he could make your opponent believe the crooked line was straight if you paid him enough.

If 'tropology' was a name for the method used to interpret rhetorical conventions, McLuhan has demonstrated that it also provides the methodology for applying those conventions to other worlds of discourse –that tropology is not limited to a study of word-use.

The Figures

If you look up the Figures of Speech, or Tropes, on an internet dictionary, you'll get an amazingly long list of Greek words, for it was the Greeks who recognized this relational use of language and made a "science" of it.

The major figures which some of us were made to memorize in the 7th grade are generally listed as: Metaphor, Simile, Synecdoche, Metonymy, Personification, Antanaclasis, Paronomasia, Syllepsis, Onomatopoeia, Anthimeria, Periphrasis, Hyperbole, Auxesis, Litotes, Meiosis, Iron, Oxymoron, Paradox, and Rhetorical Questions. Minor ones may include even more obscure terms as Accismus, Anapodoton, Antimetabole, Bathos, Catachresis, Dysphemism, Hypocastasis, Hypophora, Metalepsis, Pleonasm, Paradiastole, Par'hyponoian, plus a few dozen more.

At the surface, it appears simply that the Figures of Speech provide us with different connections possible between words or phrases, enlarging their scope of possible meanings. The interplay of environments refolds the context of an utterance … its use in a particular context becomes the instance of new potential. There is a new functionality for the figure (or focus of attention) as well as the term or phrase it replaces.

The terms employed in a novel context are not considered as specific definitions or signifiers, but rather as relating to their traditional context of use, bringing that entire context with them.

Swapping out words can throw two incompatible contexts together. But a word-swap may also play on grammatical use to *imply* a meaningful incongruity. Single words may suddenly take on the representation of a whole phrases and visa versa; just as simple sounds can do the same for words. Each form of trope has their own specialty subclasses.

No matter the names and categories provided by the Greek logicians the tropes represent a creative playfulness that is simply part of human sensitivity—they are part of our make-up. This statement begs cross-cultural verification, as well as backups from the psychological lab of the types of cognitive anomalies that require literal precision, inhibiting rhyme or the recognition of puns. Lacking proofs that no culture has yet been found that had no type of *non-literal communications,* or that lacked verbal poetry of any form, I will restate the opening sentence as:

> No matter the names and categories provided by the Greek logicians the tropes represent a class of representative playfulness that is a potential part of the human make-up.

On looking at the list of Figures above, one might notice an obvious lacuna–for *rhyme* is NOT one of the traditional "figures." It goes without saying that the Figures were always considered the coloring box of poetry, and that rhyming is central to mnemonics underlying oral literature. That is, rhyming is for memory in the oral transmission of culture. But rhyming is also more closely tied to the origin of the spoken word—the playful substitutions in the articulation of sound that consistute a word, which is the ultimate signifier of meaning. Rhyme points to the root "figure" contained in speech, that of sound production—providing alternative meanings by simply letting sound be produced with other parts of the mouth and thereby altering a consonant.

The absence of rhyme in the list of figures would seem to point to something critical in the conceptual function which the Greeks had for the tropes[146]…indeed, not that we really care what the Greeks meant, because the tropes come to exist without Greek analysis or art-form which includes rhetoric. For us, rhyming must be considered a categorical Figure unto itself.

A traditional breakdown of the Tropes.

I will assume that McLuhan's production after the traditional scholarly works (*The Gutenberg Galaxy* (1962), *Understanding Media* (1964)) was guided by an analytical exploration of tropological *technique,* applying the tropes to other forms of communicative expression. This is for McLuhan scholarship to either challenge or verify—for us, the method implied by such a Tropology would be analogous to that of the thesaurus in bringing together different potential worlds of discourse. The usage of the Figures of Speech will clarify different relationship classes, if anything.

The traditional breakdown of the tropes is generally given as follows. For our purposes, I have appended the new descriptive names, as follows: Marriage of Structure and Sound, Ambiguity as Measurement, Class-Substitutions, Semantic Inversions, Peer-Substitutions. I then attempt to derive a description of what seems to be happening from McLuhan's perspective of the original Greek term *metaphorein,* 'an interplay of environments.' The description is specifically geared to the potential role of a figure *as a type of punctuation,* that is, as a type of "punctuation mark" placed into the wider discourse.

Wordplay and puns (Marriage of Structure and Sound)
- **Antanaclasis** Repetition of a word in two different senses.
- **Paronomasia** Using words that sound alike but that differ in meaning (punning).
- **Syllepsis** Using a word differently in relation to two or more words that it modifies or governs (sometimes called zeugma).
- **Onomatopoeia** Use of words whose sound correspond with their semantic value.

Overstatement/Understatement (Ambiguity as Measurement)
- **Hyperbole** Use of exaggerated terms for emphasis or effect.
- **Auxesis** Reference to something with a name disproportionately greater than its nature (a kind of hyberbole).
- **Litotes** Understatement used deliberately.
- **Meiosis** Reference to something with a name disproportionately lesser than its nature (a kind of litotes).

Substitutions (Class Substitutions)
- **Anthimeria** Substitution of one part of speech for another.
- **Periphrasis** Substitution of a descriptive word or phrase for a proper name or of a proper name for a quality associated with the name.

Semantic Inversions
- **Rhetorical Question** Asking a question for a purpose other than obtaining the information requested.
- **Irony** Using language in such a way as to convey a meaning opposite of what the terms used denote (often by exaggeration).
- **Oxymoron** Placing two ordinarily opposing terms adjacent to one another. A compressed paradox.
- **Paradox** An apparently contradictory statement that contains a measure of truth.

Reference to One Thing as Another (Peer Substitutions)
- **Metaphor** Reference to one thing as another, implying a comparison.
- **Simile** Explicit comparison of one thing to another.

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[146] I plead guilty to not being familiar with Aristotle's *Poetics,* where he undoubtedly clarifies this question for us. If he treats the exclusion of rhyme from the tropes as a formal convention—that rhyme deals with sound substitution and not meaning substitution,--then my suggested answer holds, that McLuhan's definition of *tropology* would include rhyme within its scope.

- Synecdoche A whole is represented by naming one of its parts.
- Metonymy Reference to something or someone by naming one of its attributes.
- Personification Reference to abstractions or inanimate objects as though they had human qualities or abilities.

An example of tropes in another medium.

The use of visual tropes in comedy are probably the best place to start, if we are to consider tropological relationships beyond language. Much of the art of mime consists in conceptual visual-play with fictitious spaces and things; Charlie Chaplin's work and the dance routines of the 1930's and 40's worked the same territory.

A different type of example, which might have been attributed to Burns & Allen, occurred when a friend of mine called. I answered but he couldn't hear me, and began yelling out loudly into the phone at his end. Quite stupidly, realizing I had the phone to my bad ear, I switched to my good ear and said hello again softly—at which point he immediately gave a sign of relief, and said, "NOW I can hear you!" Don't ever again ask me anything about modern technology.

I will let you think about applications of the most common tropes to other realms of informational transfer—our purpose here is to merely describe them in terms of structural relations—removing the specific 'meaning' of the words employed and substituting their 'function' within a normal context of use. For space reasons, I have not given examples in each case, as you may look them up in any grammar text.

Marriage of Structure and Sound

The Figures of Speech which deal with sound components are the simplest, and so we shall deal with them first. They are, however, the ones with the most complicated names: *Antanaclasis, Paranomasia, Syllepsis (or Zeugma), and Onomatopoeia.*

Antanaclasis is the repetition of a word, i.e. the same sound, in two different senses. In this case, the sound is a constant and the meaning—as well as the roles, or potential roles which roll over the same sounds in your head, produce the change of context—and this is what the speaker or writer is *punctuating,* or intending. Everyone can see that we are making fun of the fact that words are only sounds particular to our own language. There are numerous overtones here, for besides the subject and content of the sentence, it reminds us of *the presence* of language in its special sense of being used and interpreted at that moment in time.

Paronomasia is better known as "punning." Punning, of course, is a jest over the sound and potential conflict of meaning in conversation, whether spoken or alone in thought. I am tempted to say that what is punctuated is the coexistence of multiple "worlds," such as James' belief sets. In the pun both sets of meanings are recognized as valid, straddling both sides of the fence simultaneously. Hopefully we are inside the gate with feet on either side of the threshold. If we are outside the gate at the time it is natural to let out a groan! The *pun*ctuation of a pun is to coexistent truths, a conjecture that refers us directly to James' pluralist stance, and provides a clue to the work of emotions.[147]

Syllepsis is "to use a word differently in relation to two or more words that it modifies or governs." The same word, used only once and having the same meaning, can relate to different parts of the sentence in quite different ways. The punctuation is like that of a pun, but more limited. This figure points to the sound-context of language, asserting that the role of sound in language is secondary to meaning—reminding us that meanings can be confused. Different roles and purposes may coexist in the experience or reality being described. By using this figure in our phrase we have added an important overtone to the meaning it—"Stay vigilant with your interpretation of words! Look at the context of the word in the phrase and the phrase in the overall communication! You may well be misinterpreting me!" And it only takes one properly placed word to communicate this, and *punctuate* this meaning.

Onomatopoeia refers to sound-play. As little children we make cow-sounds and chicken-clucks that may, in fact, have turned themselves into veritable words in the vocabulary. Where sounds correspond to meaning we have a different type of pun, which even babies can enjoy—for the substitution

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[147] which I originally developed as the logic of laughter. See my article, posted on www.academia.edu "The Risiology. Movement rules for a logically dense gameboard – the Risiological Matrix (RMat)"

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is between the cow and mommy, or the cow and the baby…or the sounds coming from the child's mouth and the soap bubble popping.

Ambiguity as Measurement

A group of tropes exist to show that *size is relative* when it comes to the contexts in which a statement is made. *Hyperbole, Auxesis, Litotes,* and *Meiosis* allow us to exaggerate or pitifully minimize something *for the effect*. What is being punctuated, of course, is size, yet by using the figure as punctuation we really mean to say that *while size is most important, its measurement is out of the question.*

> **Litotes:** understatement used deliberately: Mom's getting a**r**tistic. Steak and three snow-peas.

> **Auxesis**: reference to something using a descriptive name disproportionately greater than its nature: Before he jumped, Archie saw *the entire map of Argentina* stretched out beneath the clouds.[148]

> **Hyperbole:** Use of exaggerated terms for emphasis or effect. *If you plant this kernel you can have corn on the cob for dinner.*

> **Meiosis:** Reference to something with a name disproportionately lesser than its nature. *That 2-ton forklift was lifted by a computer chip.*

Class-Substitutions

> **Anthmeria**: substitutes nouns for verbs, verbs for nouns, adverbs for nouns or verbs, etc.

Calvin: *I take nouns and adjectives and use them as verbs. Remember when "access" was a thing? Now it's something you do. It got verbed. . . . Verbing weirds language.*

Hobbes: *Maybe we can eventually make language a complete impediment to understanding.[149]*

> **Periphrasis** substitutes a descriptive word or phrase for a proper name, or a proper name for a quality associated with it. One might turn an exclamation into a proper business name, *Incredible! Inc.* or, *"Back when I was still Sparky, Tiny and Foggy and I shared an apartment over a lacquer shop on Bainbridge St."*

> By substituting functional relationships for words we turn them into easily recognized figures, simply punctuating the recognition that words are constrained by grammatical functions, and that these functions carry meaning on their own.

Semantic Inversions

> **Rhetorical questions** use the grammatical form of a question phrase for a purpose *other than to have the* question answered.

> **Irony** may include stories or arguments leading to the demonstration that certain terms used in the language *convey the opposite* of what those terms normally intend.

> **Oxymoron** puts two ordinarily opposing terms adjacent to one another, providing a compressed paradox; "*fuzzy equivalence*" is an oxymoron. It refers to the function the tropes have mapping communications and meaning to language.

> **Paradox** is an apparently contradictory statement that bears a semblance of truth, or contains a measure of truth.

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[148] Of course, he was standing on the kitchen table, the clouds were steam from the kettle, and the map of Argentina was opened up on the floor.

[149] The example, taken from www.About.com is attributed to Bill Waterson's comic strip *Calvin and Hobbes*

The final class of tropes is the one we are most familiar with, where we reference one thing for another. *Metaphor, Simile, Synecdoche, Metonymy,* and *Personification* are the substitution of words in a sentence or phrase. This whole class of tropes is used to generate overtones of meaning through the comparison of contexts. By substituting one word for another in a phrase, these Figures are able to directly compare *contexts.* The active mind automatically places the new word *with its normal contextual use* into a new use, the one being described at the moment. Thus, for metaphors and similes, it is not the words which are being explicitly compared, but their *use contexts—*the *grounds* of the two *figure* words.

"Two heads are better than one" points to the act of thinking, and for this perspective—that of working out a problem. Synecdoche *(*to substitute a part for a whole*)* says that we are claiming an equivalence between two adults and two adult heads. But the substitution only relates to the context of working out a problem, because if you made the same comment in the middle of a soccer game, you would be making a joke, and if it were over a wig concession we'd have a pun.

Two heads used simultaneously in soccer will end up in the hospital. So the trope only works in a very particular context, in a dialogue about problem solving, for which a head is the *immediate physical context, ie,* the ground for the intended figure, which is "thinking" or "analysis. "Head" does not substitute for the word "thinking," but rather for the context of problem-solving, whether through rational analysis or some other stratagem.

Metonymy is the substitution of an attribute of something to denote it, such as, "*scorched by the blazing noon."* This phrase has left the sun out, yet we picture it through attribute, when at the top of a cloudless sky, is to blaze and burn. Blazing and burning in the context of a time of day is equivalent, albeit a fuzzy equivalence, for the sun.

Personification is a special, and quite obvious case of context substitution. It occurs when we refer to the car, or the tree, or the saxophone as having feelings. *Her car took her to Burger King. I awoke as the willow brushed my forehead with its long tresses. The angry sax leapt over the trio and into the audience like a felon.*

Tropological Dissonance

Focussing on the structure of relations has taken the focus off function—the intended work which the use of a particular trope aims. One might call this a certain type of 'stress' that may ask for resolution. The interplay of environments sets up a quality of dissonance, which from the standpoint of the *perceiver* provides different perspectives from which to compare two or more things.

To consider the tropes as merely 'substitutions' that may or may not contribute information content is hardly adequate. If poetry only added resonance or flowery style to communication, it should have no function in the real business of rhetoric which is to carry a point, and by conveying *feelings,* to persuade. To effect a persuasion, the feelings cannot taken at random, but a very particular resonance or fragrance that the speaker has hit upon for a reason.

Ricoeur lets us know that the argument that the tropes were simply ornamentation goes back to the very beginnings of Rhetorical arts—to Plato, who considered rhetoric among the 'cosmetic arts.' In his chapter on "The decline of rhetoric: tropology," he traces out the "whole series of postulates is at work between …–the primacy of the word—and the final outcome—metaphor as ornament. Step by step, they bring together the initial theory of meaning, whose axis is naming, and a purely ornamental theory of tropes, which finally proclaims the futility of a discipline that Plato had long before placed among the 'cosmetic arts.'""(idem.)

> If metaphor belongs to an heuristic of thought, could we not imagine that the process that disturbs and displaces a certain logical order, a certain conceptual hierarchy, a certain classification scheme, is the same as that from which all classification proceeds?

> …This is a more far-reaching hypothesis than the others, which presupposes an already constituted language within which metaphor operates. Not only is the notion of deviation linked to this presupposition, but also the opposition between 'ordinary' language and 'strange' or 'rare' language,

which Aristotle himself introduced, as well as, most definitely, the opposition introduced later between 'proper' and 'figurative.' The idea of an initial metaphorical impulse destroys these oppositions between proper and figurative, ordinary and strange, order and transgression. It suggests the idea that order itself proceeds from the metaphorical constitution of semantic fields, which themselves give rise to genus and species." (Ibid., 22-23)

This is, of course, the argument I'm putting forward here. Far from mere 'ornamentation,' the idea is that the tropes are basic classes of *strategy* for structural discriminations—where the discrimination includes *both an object of focus and a context of behavior,* which is another way of saying a functional reference that both defines the actor and the larger event. What is unfortunate is that as late as 1975 Ricoeur could state this postulate in his introductory chapter, but had to use an entire book of multidisciplinary studies to affirm its simple possibility. McLuhan, of course, assumes it all along.

In our case, I've suggested the term 'dissonance' as the key quality of tropological study, as it refers to our earlier picture of chaos where multiple governing strategies are in effect. Dissonance refers to the underlying stresses in the marriage—tendencies to independence and dis-harmony. When looking at the work of emotion in the next volume, it must include the interplay of emotions—the logic of the psyche within a solitary physical unit. This includes the 'personality' and that interplay to be had between personalities. Dissonance will take up the majority of the discussion—and the *management of dissonance* will turn out to be the predominant goal of game strategizing and risk analysis for the unit.

It should be noted that I've switched realms from that of discourse to that of behavior and action. The role which tropology can play is to bring both of these analyses together—for Rhetoric itself lies between realms—of representation and of behavior. Rhetoric is the science or method of persuasion, of demonstration combined with a type of syllogistic logic—of static description and a demonstration of the dynamics of choice in one's actions.

The Figures as Punctuation

In the course of our wanderings, for I feel like I've been all over the map, we met with the idea of 'toggled' relationships. At that time the problem was simply to argue for the possibility of multiple independent organizing principles coexisting, and being in operation over a single space and during the same period. From a universal standpoint, if such organizing principles are considered 'universal law,' it is somewhat paradoxical—they cannot be equally *operant*. We would tend to believe there must be some universal, absolute hierarchy of universal laws. But if we are to observe our local conditions, multiple organizing principles are intuitively obvious—since everything all about us is multi-tasking, interwoven, and independently-driven without continually grinding to a halt. Life does not seem to need to be directed from above—yet when we speak of "laws of Nature" we still expect them to be operant everywhere and at all times. We assume Nature has it all all worked out for such complex independent trajectories as take place in an ocean ecology, let alone a supermarket parking lot.

Here we were discussing relationships *between rules of behavior,* rather than the relations of words in discourse.

At the time we considered marriage as the epitomy of a toggled relational contract, defining the operating unit (the marriage) in fairly precise legal terms. The several variants of love leading up to, and out of, a marriage also suggested types of 'toggled' relations, governing human (and higher animal) behaviors, whereas sexual functionalities point to an entirely different order of relational dynamics between structures, along with their functional entailments.

The question is whether we have the right to generalize *behavioral rules* to relational pointers, such as we've seen words become—pointing to an entire web of associations in their normal context of use.

Further on, we encountered the flux logic of one, that pointed us towards the possibility of boundary-definitions and contextual relationships being tied to the shapes or qualities (or *something?*) of internal structures. I called this 'punctuation.' The analogy to 'punctuation marks' in a written language begs the question "what are the marks we are talking about, how are they combined, and what does each do for the sentence (or word) in question?' If this is what 'puntuation' implies, then it is an awfully big question.

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I believe Rhetoric is the beginnings of a sufficiently big answer. The figures of speech are, like punctuation marks, overlaid on one another constantly in normal conversation. Mixed metaphors are almost unavoidable. As I've shown, the figures are clearly about large contextual relationships –providing examples of any number of nesting classes—ordered hierarchies, logical confrontations, weak and strong forces and stresses, local/global, etcetera.

But notice here, that I am alluding to the figures as representing relational structures similar to the copulas and prepositions that James says we *feel* as we are trying to harness a percept, to turn it into a concept.

To consider relational structure as being **prior to concepts** we have to describe such relational structures themselves AS the logical concepts, AS "things in themselves". Indeed, this is what our lemma of punctuation implies.

Things in themselves

Words will themselves represent punctuations of a multi-contextual experience—placeholders for a particular universe of discourse, where that entire universe (i.e. lexicon or dictionary of terms) functions "metaphorically" between realms of sensory experience. This is not to say that this 'metaphorical function' is illusory, as we would normally consider poetic metaphor to be—rather the opposite. The function of the lexicon (in which the term serves as a strut, or relational placeholder) musts be *prior* to conceptual structure, as the "thing in itself."

So, for example, the lexicon of science points to the index of functional tests of reality which have been carried out through history—though the interpretive pointers in the thesaurus of belief sets has varied over the years.

But there are also similar word placeholders in the lexicon of experiencing Dickens' novels. In the belief set thesaurus each of these words also points to some "thing in itself." There is obviously a gigantic difference in scale between the two, for the personal experience of the novel can only be tested within the confines of others who have shared the experience of reading Dickens. Yet the *experiences* are, for James and for anyone who has experienced something profound or otherwise, "things in themselves."

The seeming absurdity in James' 1869 article on belief sets is that it maintains a reality for fantasy and thought to the realities of science, comparing the language of Maxwell and Schrodinger to *The Pickwick Papers* and *Martin Chuzzlewit.* But this is only to develop the point that words rest within a world of speech and a 'universe of discourse' sharing all of their otherwise 'explicit qualities' with their 'figurative qualities.' It is neither one nor the other—given the larger context of a universe of discourse, explicit and figurative are of a single continuous quality.

I bring this up here because it has become necessary to claim –within our particular universe of discourse—that the figures of speech are of a "higher order," or *closer to reality* than words themselves. This is to say, the *relationships which the figures are only names for…*indeed, they may be slightly ambiguous and potentially incorrect in the assignments they've been given over two millenia, but they are concepts made of percepts… terms that belong together, punctuating and indexing an order of reality that we are currently trying to harness.

Multiple Belief Sets, again

In the very first versions of this chapter, when I stole it from another book I was writing, it was about the Figures of Speech and a portmanteau I thought I'd discovered on my own, Tropology. I'd been using the term for many years, and hadn't had the occasion to look it up on Wikipedia—for then this deep well of all erudition you'd ever care to source had not existed, and I didn't own one of those proverbial OEDs with a magnifying glass. This meant that much of my scholarly existence was devoted to developing arguments to support this key piece of my personal understanding of existence—that the tropes that gave us the ability to both persuade and to sing poetically of life and love, suffering and sadness, the tropes that could best be used to represent *feelings and appreciation,* to give a hint of a taste, a waft of the spirit of something—that these tropes worked not simply by being thrown into a sentence, by painting it with colors instead of black and white—but that they worked by a clear-cut declaration of the act of *folding—through intimations of twists into a different space.* This was what the portmanteau to

mathematical TOPOLOGY meant for me, as if the insertion of that little letter 'r' after the first 't' put all of the rigour of mathematics back into our fuzzy world through language.

In trying to develop this point, I soon discovered that both Paul Ricoeur and Marshall McLuhan made reference to the term, and so this chapter has been sitting in outlined pieces for nearly a year, awaiting the time that I should fully absorb both of these philosophers enough to use them in my arguments. It was very clear that Ricoeur agreed with me, and yet *his* arguments were geared to prove his own version of reality, which was that it could only be represented through the *technê* (Greek for techneek and/or Grique for technique) of Hermeneutics. Hermeneutics is the name associated with a very old methodology of textual interpretation—where the text is believed to contain a representation of the absolute, the law, the ideal that we must follow. To treat a text in such a manner asks quite a bit from the words themselves, and the grammatical laws that hold the words together—and so scholars and lawyers and kings and magistrates have argued, and often gone to war, over the interpretation of such and such a phrase. Ricoeur's philosophical ambition seems to have been to apply the understandings of ancient Hermeneutics to the methodology of science—where the basis of the search for establishing truth and reality is the *effort of the search itself.* It is rather like St. Augustine's *Confessions* are both the demonstration and the prayer of finding truth; his struggles in decifering the term 'chaos' in his reading of the bible, taking on faith that it was handed down from God himself through Moses to us, Augustine decides that Moses didn't have to grasp what was being dictated to him when he put it down, and that there was indeed a deeper understanding to be had in the specific placement and choice of the actual words employed!

Hermeneutics is a methodology of nesting, called 'the hermeneutic circle,' which consists of spiralling up and around a point, always outward and upwards to take in another perspective and dimension on the issue. The Hermeneutic circle never ends, but is a process which the more spiritual of scholars (but certainly not academics) might liken to prayer…what I described earlier as invoking our new number one, pacioli. This was an obligation or entailment to past and future, of holding both of one's hands up with all fingers pointing outwards, which caused direction to change—one's tablet was now a blank and open to the slightest random noise to give a hint as to which hypothesis to fillowfollow, a meditation like unto a faith in gnostic gnowledge! Such might be the faith of scholars but not true academicians!

Hermeneutics is methodology, but as my skillfully rendered critique in the previous paragraph demonstrates, no one will ever accept Hermeneutics as the proper methodology of science, it is much too tainted by religious connotations. What I hoped Ricoeur's analysis of Tropology and metaphor would demonstrate through this chapter, however, was that his objectives in reestablishing the study of Hermeneutics *through* his analysis of metaphor and Tropology would link his methodology to James' Radical Empiricism. For I was never able to extract an actual *method* from James, which is a major failing in his arguments. He fights to establish an extreme and literal understanding of pluralism, and knows deep-down that this will confound the Pragmatists who hold onto functional tests at the same time as they are deeply Unitarian believers. He assumes that if you grasp his Pluralism and follow a thoroughly Pragmaticist approach to science, that your method will be governed by what he calls the "Radical Empiricist" approach. Nothing more….except that when doing your science you mustn't think. Not only that, but if you do think you may kill your entire ascent. You can only think *after* you obtain your results, and all your thinking is focussed on *interpreting your results*….e.g. hermeneutics.

Needless to say, the original outline to this chapter put Ricoeur's take on Tropology at its center, for he was the scholar that had, in his larger three volume work, *Time and Narrative,* led me to Augustine's analysis of time and chaos. And so I assumed that Ricoeur's take on Tropology must be the one I was after. But this was not the case. In fact, when I finally sat down to write the chapter, McLuhan took over. He had seen the portmanteau in its complete light, as somehow being both a science of folding, or origami *as well as a methodology for representing feeling*…of tastes and aethetics that underlie a culture.

It was then, of all things, that I realized Ricoeur's cross-disciplinary presentation of "The Rule of Metaphor" had been developed *at the behest of Toronto academics who wanted to support McLuhan's intuitions.* Ricoeur's book in fact leaves us off at his hypothesis, quoted above, that tropology might be at the very source of classification, and that the *technique underlying the arts of metaphoric usage might also*

represent the technique of all classification. This is quite a big hypothesis. Big, but not big enough to give you the feel of what McLuhan was intuiting in his anti-books. In deed, it is all you need to hold McLuhan's thesis up. For McLuhan's anti-books produce a grasp of the culture of knowledge and words in a single gulp—there is no chewing necessary, a child can grasp it without erudition.

Yet neither McLuhan nor Ricoeur seem to have grasped the wonderful pun in the portmanteau, that just a little 'r' can set all the rigour of mathematics to work on fuzziness of life experienced through language instead of directly.

My intuition is that the tropes will open up the world of folding, to give mathematical topology far more potential scope for experiment … and ideas of folding a more central *intuitive* role for what we think of as 'mathematical.' Balancing, as in olden days, spatial ideals with number theory, in the toggled and often dissonant marriage of geometry and arithmetic.

But this is only a swatch of an intuition,[150] for we must never forget that we're talking of The Great Reality Sandwich here! Folding, which is the essence of topological, trying to grasp connections between structures despite any and all possible deformations to their surface—allowing stretches and twists and folds but not cuts—does not yet attempt to describe *occlusions.* And I believe that the addition of that little 'r' after the 't' in *topological* entails a science of perspective and *taste* that can be accounted for by representing what has been lost through a particular act of folding.

I will conclude with a rather lengthy quote from Ricoeur. It is from the introduction to his book on metaphor. Here he produces a wonderful description of the boundaries of rhetoric, yet he doesn't actually say that *what he is excluding* becomes the definition of greater field he has occupied. Plato's denigration of the art of rhetoric *'as no better than the culinary arts'* effectually says that the master of rhetoric has also become the master of *another person's taste.* This much he makes extremely clear..but that this includes a *positive* science that *includes* falsification and embellishment is not so well-clarified. His footnotes elaborate an even wider scope to the Athenians' understanding, and imply what even Ricoeur hesitates to say outright:

> Rhetoric is without doubt as old as philosophy, it is said that Empedocles 'invented' it.[151] Thus, rhetoric is philosophy's oldest enemy and its oldest ally. 'Its oldest enemy' because it is always possible for the art of 'saying it well' to lay aside all concern for 'speaking the truth.' The technique founded on knowledge of the factors that help to effect persuasion puts formidable power in the hands of anyone who masters it perfectly—the power to manipulate words apart from things, and to manipulate men by manipulating words. Perhaps we must recognize that the possibility of this split parallels the entire history of human discourse. Before becoming futile, rhetoric was dangerous. This is why Plato condemned it.[152] For him, rhetoric is to justice, the political virtue *par excellence,* what sophistry is to legislation; and these are, for the soul, what cooking in relation to medicine and cosmetics in relation to gymnastics are for the body – that is, arts of illusion and deception.[153] We must not lose sight of this condemnation of rhetoric, which sees it as belonging to the world of the lie, of the 'pseudo.' Metaphor will also have its enemies, who, giving it what one might call a 'cosmetic' as well as a 'culinary' interpretation, will look upon metaphor merely as simple decoration and as pure

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[150] and the greatest criticism of this book is that it first here and then there, that I cannot keep to a single thread of discourse….that it is packaged as an academic text but that it breaks the rules, and is nothing more than a McLuhanesque pastiche of ideas. Either you go with the flow or you are left at the curb, and everything runs together towards the drain.

[151] Diogense Laertius 8: 57; 'in the *Sophist* Aristotle reports that "Empedocles was the first to discover (*eurein*) rhetoric"' (cited in Chaignet *Rhetorique 3, n.1).* Ricoeur's footnote 4, p. 323.

[152] The *Protagoras, Gorgias,* and *Phedrus* lay out Plato's uncompromising condemnation of rhetoric: 'But we won't disturb the rest of Tisias and Gorgias, who realized that probability deserves more respect than truth, who could make trifles seem important and important points trifles by the force of their language, who dressed up novelties as antiques and vice versa, found out how to argue concisely or at interminable length about anything and everything' (*Phaedrus* 267 a-b trans Hackforth: see also *Gorgias 449 a-458 c).* Finally, 'true' rhetoric is dialiectic itself, i.e. philosophy (*Phaedrus* 271 c). Ricoeur's footnote 5. pp.323-324.

[153] 'To be brief, then, I will express myself in the language of geometricians – for by now perhaps you may follow me. Sophistic is to legislation what beautification is to gymnastics, and rhetoric to justice what cookery is to medicine' (*Gorgias* 465 b-c, trans. W.D. Woodhead). The generic term for these simulations of art –cookery, cosmetics, rhetoric, sophistic – is 'flattery' (*kolakeia,* ibid., 463 b). The underlying argument of which this polemic presents the negative side, is that the mode of being called 'health' in the order of the body has a counterpart in the order of the spirit. This homology of the two 'therapies' regulates that of the two pairs of authentic arts, gymnastics and medicine on the one hand and justice and legislation on the other (*Gorgias* 464 c). Ricoeur's footnote 6, p.324.

delectation. Every condemnation of metaphor as a sophism shares in the condemnation of sophistry itself.

But philosophy was never in a position either to destroy rhetoric or to absorb it. Philosophy did not create the arenas – tribunal, political assembly, public contest – in which oratory holds sway, nor can philosophy undertake to suppress them. Philosophical discourse is itself just one discourse among others, and its claim to truth excludes it from the sphere of power. Thus, if it uses just the means that are properly its own, philosophy cannot break the ties between discourse and power. (Paul Ricoeur, from *The Rule of Metaphor*. pp. 10-11)

If I haven't made myself clear yet, you need only ask why the title of this section is "Multiple Belief Sets, again." I am attempting a McLuhanesque pastiche, to demonstrate by dancing what I cannot prove with a direct thrust. The art of Rhetoric is about stretching and folding, of deforming without cutting—of hiding one truth while flouting another, and quickly gliding back to the first. The transition may work one way, but not the other—and I would lead you to believe that it does. I have no doubt that art and life fit together as tightly and truly as science and life—but to prove the equivalence holds from art to science *and by an entirely different route—from science to art,* is an undertaking I cannot yet map. However, we have very clearly presented a most academic solution to James' insistance on multiple belief sets; it lies hidden in the sources and arguments over rhetoric. There would seem to be a positive science of falsification in the old arts of discourse. The art of embellishment, in fact, can lead us to a science of occlusion, another way of saying 'blind spots,' or the belief sets that were the youthful source for James' life-long battle for pluralism.

In Tropology we uncover yet another acceptable support for Jamesian pluralism. It should be no coincidence, therefore, to discover in Ricoeur's Hermeneutics provides an acceptable support for James' Radical Empiricism.

11. ...of Declensions and Occlusions

Introduction to Occlusions—inroads on evil

"Telling a white lie" is another way of saying *lying by omission,* which is falsifying a representation without completely distorting it. You tell the white lie because, assumedly, to not tell it would be more counter-productive. Thus falsification may help accomplish something positive, or at least what someone happens to claim is positive. The mafia gets through a lot of falsification this way, sometimes having to occlude a witness here or there, but it's all part of the game.

Having explained what I meant in the previous chapter by "a science of positive falsification," I will take back what I said about Ricoeur not wanting to admit his objective in reintroducing a stronger and more well-defined rhetoric was to cover a much wider-field than taste and persuasion. For his philosophical life-objective was to grapple with a philosophy that might cover evil—not as something merely missing or improper, or even counter-productive or fully destructive—but existing as a demonstrable negative force that might be *proven evil.* So in taking on the topic of rhetoric as the science of the lie, of deception, of the 'pseudo-real' he is clearly making inroads on his long-sought and elusive quarry.

This problem, of evil, was a key factor driving James, as well. He was brought up in a household by a loving and attentive father devoted to preaching and religious works, and he lost two younger brothers to the psychological ravages of the Civil War. PTSD is not new, it is just the recent diagnosis of something that used to go un-noticed. The evil of war is just dropped from focus and out of the public eye when "getting things back to normal" is highest on everyone's agenda.

Evil is *not* the topic of this chapter, but being as our overall topic is *Thick,* this particular chapter represents a nodal connection to a philosophy that cares about the problem of evil. The closest we will come to this problem will be in the second volume, where we deal with strategies for managing the 'chaos' of multiple governing principles, but it is a very important perspective, and perhaps the most important quality that the topic of declensions (and their artifactual occlusions) brings to this study.

Foldings
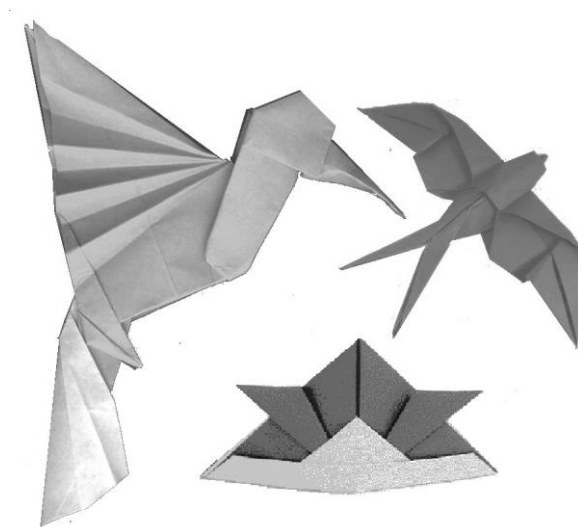
If you have ever tried gluing a printed piece of paper to the inside of a concave surface it will become wrinkled. It is possible to make sure the wrinkles do not occlude particular letters, and thus distort the message, but if you don't pre-plan the folds carefully, it is more than likely pieces of letters will be missing. The subject of this chapter is about wrinkles and folding. It seems to be a rich enough subject for an entire book, but without writing the book it is necessary to introduce the concepts. It follows directly from the Figures of Speech, if we consider them from the standpoint of swapping out whole frameworks of use and meaning…in the sense of indexes accessed by a thesaurus of sorts. Wrinkling and folding

might be thought of as swapping internal components around in order to point to a different framework of use and meaning—in the language of Gestalt, to indicate a different 'shape,' or melody, or 'gestalt.'   It is their very nature to have to hide certain portions of their whole when folded in different ways—so that, for our purposes here, I am tying together the art of folding with that of occlusions. And this should tell you why I opened with the connection of Rhetoric to deception and little white lies….our outright falsehoods.

The connection to Rhetoric, however, is important, since languages generally provide a method of 'folding' the words in one's discourse to indicate the particular framework in which the discourse lies.

Declensions cover the way in which words themselves are "folded" with standard rules of vowel changes and additional prefixes and suffixes to signify the context in which the term is to be understood. Even though English is very poor from a declensional standpoint, we are still familiar with certain sound modifications indicating tense –the addition of suffix 'ed' for past tense and prefixed helping-words for future.

Many languages other than English (but not English) carry within their grammar a philosophy of *changing perspectives.* In a declensional language, the words which we associate with a reality of *things* and *relations between them* change depending on the context in which they are intended to be understood. It is the bane of every English-speaking student to have to learn the declensions of words at the very beginning of the first year term of the non-native language of their choice, having endless rules of *doing and being* relations drummed into their skulls even before they've got a basic vocabulary down. Apparently, some languages believe that the "hows & whys" of speech are as important as the "whats," whereas English, being a non-declensional language, believes if you get all the "whats" down in reasonably proper order, the "hows & whys" shall make themselves quite clear.

One could logically class declensions under three major types—relational, process, and contextual declensions—which any particular language might mix and mingle somewhat, not necessarily this fashion. I mean the three classes merely to help describe and introduce a *feeling* for the way declensions can create a perspective on the structure of the world of discourse, and thus the world of thought.

Our *purpose* in discussing declensions is that their existence in the living world of human communications points directly at the way the blooming buzzing chaos of the world is organized as it is experienced. Declensions can be considered a *methodology* of mapping reality which may or may not correspoind to anything "true" except an apparent need for this particular method.

Process Declensions

Process declensions are most familiar in those languages that modify the word that is performing an action, or having an action being performed on it. One often modifies the vowels that hold the consonents of the root word together, but might also provide rules to change certain consonents at the end or beginning of the root word, either softening or otherwise modifying them according to how they're produced in the mouth, by the tongue, or lips, or teeth, or glottis. A prefix or suffix might also be attached.

How the actor might be involved with some object often relates to a *functional relationship,* and could indicate necessity, nurturing, participatory interaction, or creative modification…adding new things to it to effect a transformation. How something is acted upon or changed might be direct or indirect, with the hands or feet or by a group or through natural means—that is, by decay or through violence of some sort. These suggestions are not intended to be exhaustive, nor should I need to give examples from existing languages; the Indo-European languages alone provide the simplest of these relational declensions.

While declensional languages generally provide for fairly straightforward single functions, which are complicated enough; yet the few examples I gave (necessity, nurturing, etc.) are obviously *not exclusive of one another.* Process relationships often apply simultaneously between different actors in the context of the same sentence, and attempts to apply the right process declensions is naturally confusing. Reality folds itself differently depending on the inter-relations of actors and constituents, and one's language generally provides rules for assigning priorities and emphasis to them.

Context Declension

For our discussion of "declension" as a linguistic means of representing the same reality with different "folds" applying to it, I will add a type of folding which is not normally considered a

"declension" at all—where what is pointed at must be given a different name because the context is quite different. I wish to address the cliché of "a hundred ways to say the word *snow*" among the Inuit or Eskimos. Clearly what *to us* is undifferentiated frozen ice crystals in a loosely packed form is not this alone…and for sure, if an entirely different root word is provided for, say "snow for tracking game" than "perfect snow for making igloos" we should say they are different words pointing to different things. But if the root word for the former has different forms (either prefixes, suffixes, intermediate vowels, or a combination of these) to indicate reindeer, seal, polar bear, or penguin then we are correct in calling it a *declension.*

Snow is no longer seen as a discrete term for frozen crystals of H^2O, but as the pointer to an entire map of relationships. A declensional language is a set of rules for both drawing and interpreting the map for any term, providing us the context for understanding the communication of the speaker.

Hierarchical Declensions?

Hierarchies have often been considered the paradigm of ordering principles, yet we've seen that in real life –at least for family structures—they regularly fail at this function. In the history of Ethnology, one of the first pieces of analysis the cultural anthropologist carried out was a list of terms for family relationships. This spoke to a pivotal sense of a people's society—the notion of family, tribe, inclusion and exclusion principles for the group. It might also constitute the notion of "individual," and differentiability; and just as the Bourbaki group showed you could build a unified theory of mathematics on the notion of sets and groups, the hope was that Ethnology might build a notion of society up from the primitive language terms used for the family.

A hierarchical network of uncles, aunts, and multiple step-families is not especially *linear* in our sense of an ordered set, since each marriage brings its own "pseudo-linear" hierarchy into the picture. Even within a direct line, anyone who's tried working out a family tree knows how one's family of ancestors expands to unmanageable proportions, and once some branch finds its way back into a village it becomes strangely intertwined between generations as a great-grandmother who ranks in the nth-generation has married someone in the n^{th-3} generation through another branch.

An illustration of what I mean is easily demonstrated with the common "parent/child" relation. The simple version is that every child has a parent, having numerous brothers and sisters who were born of parents, themselves having numerous brothers and sisters, on up to the original set of parents. Thinking of it most simply we generally picture a tree something like Figure 1, which is an easy way to escape the complexity of Figure 2, although it isn't *incorrect*:
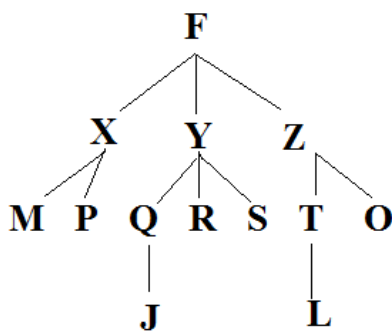

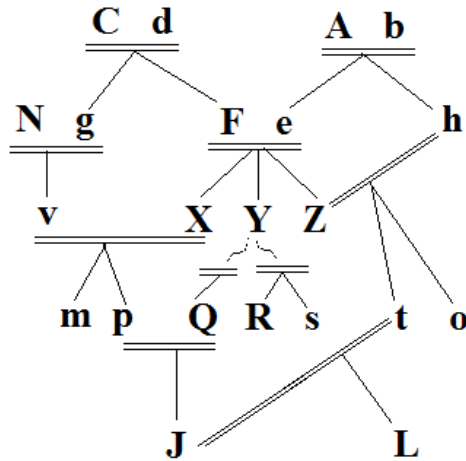**Figure 1. The Reductionist's linear hierarchy**

Figure 2 The Actual Knotted Relations (males/FEMALES)

Once we've studied Figure 2, recognizing that it only represents a *slice* of an even larger family tree of roots and branches.[154] Like many an ancient human tribe or old village, it becomes clear to call something "a hierarchical relationship" is not explanatory at all, but simply suggests a potentially knotted and twisted set of ties binding the units together in slightly different and unique sort of ways. L's great-grandfather on her father's side [b] is also her mother's great-great-grandfather; her mother's aunt [Z] is also her grandmother on her father's side; , but since her other grandparents [p & Q] were cousins (through two sisters X & Y); [p]'s mother and father [v & X] are cousins, his grandmother on his mother's side is the brother of his grandfather on his father's side, [F] is his grandmother as well as his grandmother-in-law; [h] being his mother's uncle AND brother-in-law, as well as his daughter's father-in-law.

[Y] brings up the potential of accounting for multiple step-fathers and mothers and the possibility of legal marriages between siblings of alternate step-parents (that is, the son of A+B marrying the daughter of C + D, where A and D have since re-married, raising the son and daughter of the previous marriages in the same household). To call the nuclear family the pillar of society was simplistic in previous centuries, and has become even more ludicrous today. Our idea of the family as a linear hierarchy fails—but what it does do, perhaps most clearly is to demonstrate that *hierarchies are always potentially knotted*.

The distinction being made here is that knotting is non-linear, but rather topologically analyzed—and topology is the realm of folds. It is Yourgrau's argument against basing arguments of form and order around the tactile senses of Euclidean dimensionality. We had do much better with the arguments of our tongues or our ears.

So could the hierarchical chart in Figure 2 (above) be reflected into a declension? If English were a declensional language, we should have a way to differentiate cousins, aunts, uncles, and step-family relationships through agglutinative prefixes and suffixes…that is, allowing us to tack on a string of prefixes for parental lineage, and a string of suffixes for sibling relationships. For example, *famaha*BRO*st* could mean "my step-(male cousin) "brother" of my (step) father's female cousin….when you *might* have said, "I'm engaged to my fahamaBROst." This is auditorally discrete, and your friend could make sure he got that straight…"did you say *fahama* or *famaha?"* Without the ability to decline things, a kid could only say "I'm engaged to my step-cousin, who's *really* only a second or third cousin through my step-dad," which really doesn't tell you much. This should score a point for declensions, since they would make modern extended families much more meaningful, and less linguistically alienating to kids. The real point which is to be made is that hierarchical relationships, or "trees" are often vast and complicated enough, straightforward as they are, on a tree—but natural relationships, when sketched out in such a fashion are frequently far-beyond the complex, approaching the chaotic themselves.

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[154] We don't have N's family noted, she was an outsider. Y has raised Q, R, and S without their fathers noted

'Diclensional space,' and Universes of Discourse

It is fairly obvious that James' multiple realities can be considered from the standpoint of linguistic declensions (our 'diclensions') rather than as separate worlds each with its own language. Consider those languages that allow one to put everything into a particular contextual 'tense,' such as "conditional," or "subjunctive" form. One will not only decline verbs, but restructure one's sentences, adding from a selection of terms to qualify objects and color situations in accordance with the "frame."

How, then, does this relate to declensions? Declensional languages *exist* in order to handle multiple types of consistency sets—terms (which were invented to be differentiated in the *spoken language*) point to a state or condition which was understood to be malleable and changing—and those changes reflected consistency with one aspect of reality or another. Consistency within one world-view does not negate the potential for the same term to be seen consistent within an entirely different function and reference—and so in a diclensional language pointer-words change much in the same way the reality they pointed to changes.

If we can accept this connection, then declensional languages provide us with a better clue as how to handle James' multiple "realities" or "worlds," and one able to handle these we can easily navigate the pluriverse. His "realities" were not intended as universal categories, but are an attempt to point at a universal situation or constraint to thought –rather like saying it is impossible to lay our entire world of experience against the inside surface of the egg…or an egg-carton…that we structure our belief-sets according to a set of criteria of relative disbelief, which in turn is based on the notion of consistency sets. These would be how we inspect the edges of wrinkles in different vectors of the egg, or egg-carton.

In a given circumstance of action (relative to our function and purpose at the moment) we rule out what we consider inconsistent *with our current frame of reference.* Thus, we develop discrete and bounded belief sets, with specific rules governing choices we make in the overlapping regions of reality.

Summary

Both diclensions and the Figures of Speech are instantiations of our representational tools for human communication—but this essentially means that they are also modelled on the structural constraints of 'cutting' the flux of experience. Throughout the book we have been focussed, along with James, on the idea of single concepts, as if these are words or terms that refer to a wider relational framework. But human communication is very much part of the flux as it would be read at an entirely different level. In this sense, *discourse* represents an attempted 'cutting'…a discrimination of an event and its meaning, for example, the disambiguation of a contract or a love relationship. So the structural constraints that are built into our languages as *grammar* are in effect instantiations of deeper structures e.g. classes of punctuation, capacitance, and coincidensity that we will be developing in Volume 2, *The Work of Emotion.*

Declensions, which probably belong in the 'science' or method of some future *Tropology,* are rather like optional rules or board-configurations for the game—which will be called the "work" of emotion. They belong in this volume, however, because they are clear-cut indications, the rough edges in more elegant Pythagorean and ideal explanations of things, that point to a truly a pluriversal world.

12. Conclusions: Life in the Pleniverse

Having convinced himself that James' ontological argument has been sufficiently established, the author shows once you have accepted extreme pluralism everything goes on as before. Radical Empiricism is not *really different than the current methodology of science,* it is only couched in a different theory of *knowledge* and meaning, which the author calls *'radical epistemology.'* The chapter concludes with a summary of this volume in relation to volumes 2 and 3.

James seems to have failed introducing his version of extreme Pluralism to the world at large…indeed he was speaking to a cultural era and world view still ruled by Queen Victoria, Kaiser Wilhelm, Czar Nicolas, and the likes of William McKinley. The ostensive goal of this book was to try it again for him in these times of Donald Twitter Trump. If we can't grasp the concept of living in a pluriverse *now,* it's probably too late. However, it still needs a bit of finessing.

With this end in mind, I propose dumping the dichotomy of a *uni-verse vs. pluri-verse* (or 'multi-verse'). It is tendentious and insulting in its simplicity. Instead, I believe we can accept all talk of the 'universe' as referring to "the universe of discourse," which is understood to be a bounded region of reality that we are attempting to grasp at any given moment.

One can speak of Reality, in capitals—the whole of reality, but "grasped" with a sense of human humility. Humility demands recognizing that to grasp the entire at essentially *all given times* must remain unspoken…only such an ideal construct as "God" could ever address such a Reality.

The term of ostension I suggest for this 'Reality' is '*The Pleniversal*' or simply *pleniverse.* It is sufficiently fuzzy to impute n-numerable perspectives or cross-sections, each of them known as *the universe,* but understood as "our UNIVERSE of discourse," at whatever angle we are seeking to understand. In this way we are maintaining the differentiation of Void/Flux/Plenum that was developed earlier, and it will come in handy in our later discussion of the nature of 'work.' For this must begin with the intellectual work of establishing *working definitions* such that we can talk about things without stepping on each other's beloved categories, each in their respective universes of discourse.

The *pleniverse* is clearly a substitution for James' 'pluriverse,' which as it stands forces us into the argument of monism vs. pluralism. As we've seen, this is such well-trodden territory over two millenia, that there is no way to avoid stepping on someone's categories and disrespecting their life's work. The *Pleniverse* has a much softer tread, for it relates to our experience of existence in the Plenum (allowing us to speak of it as a "universe"—but with the specific intent of "our experienced universe") while allowing for a parallel discussion of the intersection of that "universe of discourse" with the penultimate existential boundary as taking place in the Flux.

From here on, having resolved any arguments about Jamesian Pluralism with the above strategem, I will attempt to introduce the next level of effort, when we must take up the nature of our intentions in life. This is the analysis of work, but from a more generic standpoint—for this entire effort, learning to navigate through a Jamesian Reality Sandwich, has been guided by the need to introduce the terminology that will allow us to climb, or sail, or construct things in a Radical Empiricist way. The goal has been to build a conceptual framework for a methodology.

Mental Dental-work for the Great Reality Sandwich

Earlier in this work I used James' criterion of *Thick* as a way to pass judgment on Complexity Science, essentially saying that if a science cannot be appreciated through a simple explanation to a child, and understood to a greater and greater extent as one's experience and appreciation of life grew, then it probably wasn't 'true' enough to reality yet. The claim is for any good representation of reality to be appropriate to everyday experience, and explainable in those terms.

This is a rather extreme demand, and I tremble to think of applying it to my own philosophy which loses me every time I come to a corner and can't remember where to go next….

My requirement to explain it to a child reminds me of that awful saying in business, KISS, or "Keep it Simple (&) Stupid!" Such a requirement is often the recipe to fail—but what is meant by it is actually to 'speak to your audience,' who is –in your expertise—probably stupid. I created an entire book to eluscidate the nature of the bureaucratic, and the reality of compounding many Peters risen to their level

of incompetence. But that is a whole different perspective, and to explain it I must refold this book, ignoring many important points, in order to explain stupidity. But that book is called *Stupidity & the Sublime,* so it explains another important point that I won't ever get into here.

I will be quite frank, the philosophical perspective being constructed in this volume represents the one/third mark of the whole. It is already made of so many parts, and includes so many newly-formed concepts, that it becomes incredibly cumbersome. I found I couldn't even attempt an overview. I can hardly hold all the pieces in my hands or mind at once—so naturally I get scared if you want a simple and stupid overview. I can't hold the pieces in my hands, but I can juggle everything with ease if you let me talk fast.

However, as a one-time professional in technology transfer, I'll tell you, it is quite another thing to teach someone *else* to juggle…. Just try teaching someone to tie their shoes.

I woke up this morning and saw the improbability of ever succeeding in explaining why pluralism depends on percepts and concepts and chaos and density and punctuation…and I can't remember what else without looking at my Table of Contents, and began fuming at all those worldly-wise critics who smirk at me and say, remember KISS!

Still fuming, I went downstairs, made coffee, sliced some gouda, and put down the toast. But I am past my seventieth birthday, and having never invested in periodontal work in my forties—since passing sixty-five I've lost many teeth and use different partial dentures. We are supplied with different teeth of different shapes for different functions, and that they all fit together in a well-formed mouth.

So that when I went to bite into my toast and gouda, I found that I was lacking several major functional representatives, and took many more frustrating minutes—for gums don't do well with toast. The coffee went down easily.

There is a lesson here. The philosophy presented in this book will need chewing. For bureaucrats who would insist on a KISS to solve all their questions, I am happy for their life in liquid form. The sound of a single tooth chewing is more than one hand clapping, it *is* the sound of sucking and slurping—which is what babes and drunks without dentures depend on.

There are more than a few percepts here, and you will definitely need more than one tooth to chew them with… to properly taste them and appreciate them…like the concepts and percepts that work together to let us walk. To appreciate experience to its fullest, we need all the functionality of a good set of teeth, and the counter-argument to KISS is that *sometimes* there is a necessary complexity to conceptual relations; for mental work you could require dental work.

Reality may be simplified, it may even be injected intravenously through a tube or a smartphone connection such that there is no work necessary other than suck it all up and continue drinking, sucking, or injecting it. For those who prefer this life methodology there is no Great Reality Sandwich at all. There is little to navigate, unless you have discovered the emotions and are personally having some difficulty navigating.

If this is the case, and you want to navigate them better, you shall need teeth. The purpose of this volume has been to create the tools, i.e. teeth, to chew that biggest piece of the human experience—the emotions—which are NOT simple and stupid. Except when you treat them that way they will always be stupid and simple, stupid. KISS up to it! We had better have some better tools.

Do not complain if you don't see how the argument between pluralism and monism will have anything to do with understanding the emotions. Do not ask me, until I can explain *The Work of Emotions,* what it has to do with chaos, or complexity, or density, or punctuations. Be content that this book has shown you that when there is no strict "monism" to be had, there is also no "plural" left in anything. The monist/pluralist controversy is a non-argument. When it becomes a non-argument, the controversy shifts. There is something else going on, and where we are between the proverbial rock and the hard place is a world of strategic gaming---shifting the flux, the blind spots and the chaos, like trying to stabilize a water-bed.

The second volume (*The Work of Emotion)* is developing another set of teeth to chew the deep meta-personal problems to explain a philosophy of the pleniverse each of us exists in. Philosophy, is after all, supposed to be about BEING and not just *doing*.

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To be truthful, at this moment I think I have most of the pieces on the *work of the emotions,* i.e. the personal piece, but I still don't know how they work together. I must still juggle them into the finished book—for we now have a strategic 'gaming mode' of "punctuation," of naming and creating the units that make up our universes or pleniverse of discourse. But it is clear that this can't be put too simply—in the world of games, we already know there'll be cardgames, with as many permutations as there are in cards—there will be classes of boardgames, and modes of gaming that structurally map to any and all of the field sports and Olympic competitions. For if there are special ways to consider strategies and goals and rules, they are optional structures to be tackled by the work of the emotions. Describing them all in an overview is already challenging; what we need to come out of it with is an understanding of the basic forms of risk strategies in each realm of games.

Volume 3, *Coincidensity,* is truly about the Great Reality Sandwich. It is about the Pacioli Principle. At a KISS level, and to explain to an eight-year-old, one might say it is about the umpire in the big game, where all the strategies combines, and where values and right and wrongs come in. In liquid form it is called "the bottom line," and yet we'll need teeth from the previous two volumes to explain why money succeeds in doing what it does for people, and exactly why money fails at being the final arbitor—though many are content to have it play that game.

Pacioli explains how we perceive events, and store them to memory—so there is something else you can explain to the eight-year-old and the KISS bureaucrat. This part of the entire philosophy is about *time,* and that money and value is also about time. And if they have any more questions, they'd better get some teeth.

One more thing I should add. I ended the other book with a similar critique of KISS in which I quoted the old Shaker song, "'tis a gift to be simple…" There is actually not a thing wrong with the innocence of childhood, depending on a single source of strength in one's faith, that is, to "keep it simple," but not Stupid. Yet there is also nothing the matter with owning a pair of dentures to deal with things when the reality requires you to 'bare your teeth,' when you may need incisors and grinders for a few punctuating events. And there is nothing the matter with taking out your dentures to go about your business. Just remember to put them back in when you are particularly frustrated with the way everything turns out and you need something to chew on.