Transformational Schematic Representation, Repetition, and Mimesis across Dimensions

The Advance of the Systems Engineering Discipline through an extension of Systems Theory

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Schematization of Form

In this chapter I will explore the relation between Mimesis, Representation, and Repetition within schemas across dimensions. The insight that is driving this working paper was received by reading Michael Taussig's Memisis and Alterity: A Particular History of the Senses. It is interesting to compare what Taussig says to what Deleuze said in Difference and Repetition. Deleuze draws the distinction between Representation and Repetition. We have used that distinction to talk about moving up and down the dimensional ladder within schemas. Repetition is always a reduction in complexity and thus in dimensionality. Repetition on the other hand is an increase in complexity and the extension out into other dimensions. At first I thought that Mimesis was another way of thinking about representation. But eventually I realized that instead it is clear that mimesis is a process of mirroring that occurs between the product of repetition on the one hand and the product of representation on the other hand. Thus as we move from say the three dimensional form of the building to the two dimensional form of a building's representation as a picture we have a reduction of complexity and dimensionality. On the other hand as we move from the two dimensional building plans to the three dimensional model of the building then we have a complexification and an extension of dimension. The point is that the model is a mimesis of the building and the picture is a mimesis of the plans. Mimetic reflexive mirroring runs right down the center of the ontological hierarchy of the schemas. Each level of the schemas is split between downward representational transformation as with perspective in the case of the schema form, and upward repetitional transformation as with rendering as the plans are made into a model. Once side of the mimetic mirror is the simulacrum and the other side is the object in the world and its image. Repetition produces the simulacrum. Every level is a four fold laying out of the structure of the schema. The plans and the building are the most concrete expressions of the artifact in question. The picture and the model are somewhat removed from this concreteness. The model interprets the plans and the picture interprets the building. But both model and building can be seen as different expressions of the plans which give the plans to us in a way we can absorb more easily. But of course it is the building itself that all three images result in. The plans give expression to a single possible design from among a myriad possible designs. Plans are concretizations of a specific point in the design space. The model is a rendering of the plans but the building is a realization of the model. The picture is an impression of the plans but a capturing of a perspective on the building. The

builder creates the building, the artist creates the picture, the architect produces the plans, and the modeler produces the model. Brunelleschi who created the dome of the Cathedral of Florence had all three of these skills, but today they are specializations. Brunelleschi created perspective which is the codification of the representation of three dimensions in two dimensions. His painting does not survive which was the first painting with perspective. But it was created as a view from the cathedral down one of the streets in such a way that one could not tell the difference between the street scene and the picture. A model of the cathedral to be built was in one of the courtyards of the cathedral, and for every competition at the various stages of the completion of the cathedral various models were made by the competitors. Also there were plans on paper but no one trusted those and so there had to be models and the realization of models brought us pictures in perspective. All four of the parts of the schema Form fit together very closely in a kind of synergy. This synergy bridges the dimensions taking us from the two dimensional plan, to the three dimensional model based on rendering, and from the three dimensional building back to the two dimensional model based on perspective. Mimesis between model and building and between plan and picture within a dimensional realm occurs as a reflexive process. Perspectivization and Rendering allow us to cross over dimensional thresholds. By looking at the way repetition and representation occurs between dimensions within the Form Schema we get an acute image of the inner structure of the schema itself and how the transformational and mimetic power of the schema is generated. Transformational power is dissipative ordering and is related to the dissipative special system. In one case dissipation is going downward and the other case dissipation is going upward in their order creation. On the other hand mimesis is reflexive social and related to the reflexive special system. In the relation of orthogonality between the dissipative ordering of transformation and the reflexive sociality of the mimesis there is a juxtaposition or a conjunction that speaks of the autopoietic symbiosis of the autopoietic special system. We see that in the juxtaposition diagonal across the square between building and plan and between picture and model. An autopoietic system must contain its own plan. In order to produce itself it must manufacture itself according to an inbuilt plan which it uses to model itself prior to bringing the self-built new part of itself on-line. It must be able to picture itself and recognize itself in order to know if it has implemented the plan it had within itself of itself. Auto-poiesis, self-production, is a circling around the square of the schema of form moving through the moments of self-mimesis and of self-transformation. And all these moments were there at the beginning of the Renaissance in Brunelleschi and his accomplishment of the building of the dome of the Florence cathedral. We see perspective in Brunelleschi's first perspective painting now lost but described by a contemporary who saw it. We see rendering from plans in his production of elaborate models. We see how he studied the buildings in Rome as models. We see his elaborate trick on one of his fellows where mimesis played a big role. All the elements of the reflexive autopoietic dissipative special systems combined into the infrastructure of the form schema were there at the beginning of the Renaissance and probably earlier going back to the work of Anaximander that was also based on the Architecture of his time. Brunelleschi was merely re-discovering the structure of the metaphysical worldview set in place by Anaximander in a more complex way.

It is important for us to realize that the Schema is an intertransformation between dimensional levels. Schematization has its own emergent hierarchy partially structured by dimensionality but that cannot be reduced to it. Rather Schemas allow us to intertransform between dimensions without leaving the same schema. But since this intertransformation is two way it involves representation and repetition. And

because the two directions mimic each other there is mimesis of alterity or difference across the reflexive divide of the two directions of the flow of dissipative ordering up and down the hierarchy. The four quadrants of the schema produce an autopoietic circle that allows us to bring together all three kinds of special system into a single realization similar to the way they were found together in the Pascal Triangle by which dimensions were generated based on the unfolding of the minimal solids in each dimension. The reflexive autopoietic dissipative conglomerate generates dimension as it generates in parallel also the schematization. To find this same conglomerate in the schematization as well as in the dimensionalization is truly amazing.

Visualization of the Hierarchy of Schemas

What we want to do is take this understanding of the schema of the form and apply it to the other schematic levels. This turns out to be a very hard thing to do because we understand form as a schema very well. We do not understand the other schemas very well. However, this has to be our dream because this quadrate of the schema of form gives us a full definition of that schema, and if we had a similar definition for other schemas then we would consider the discipline of General Schemas Theory as being well on its way to understanding the nature of the various schemas and their differences and similarities. We postulate that at every level there is a conjunction of the special systems in some unique configuration. We postulate that because schemas are emergent that each organization of these quadrates is unique to that schematic level. But we also postulate that the schematization is guided by dimensionality and that dimensional unfolding is basis for the differentiation of the quadrate of the schema in every case. We also postulate that there must be transformations not only within schemas but between them. In fact, we are probably working our way up the meta-levels of N-category and N-blob theory as we move out to these various levels of abstraction of transformations, transformations of transformations, etc. We can use these postulates as our guide to slowly working our way out from the form schema to the other scales of schematization. If it were possible to move both up and down the ontological hierarchy from the form schema to understand the others then we would have produced a unified theory of schemas that is truly general. That is an admirable but still far off goal because of the emergent levels we have to surpass in order to understand how the constraints on the schemas produce different organizations at each level. Here we will begin this process and see how far we can get in the quest for a full understanding of representation, repetition, and mimesis at each level of schematization.

What we come up with here will only be a first tentative theory. This is because as soon as we leave the level of form we are on unsure ground. The whole of our tradition has worked out very carefully the relations between buildings, pictures, models and plans. In many different disciplines these modes have expression. For instance, in Systems Engineering there is the final system that is built to be used in the world and that has a clear relation between it and the Design, the Simulation, and the Representations of the Design or perhaps the ConOps. We might be talking about a product, its design specifications, its marketing literature, and mock ups or sales floor models. For instance, we are constantly being shown prototype concept cars made by the car industry but never produced. These are very different than pictures of new cars in sales brochures, or the actual specifications of a car used to build it or a new car setting on a sales lot. We are used to these differences between the status of representations and repetitions of things at the level of form. We build and play with models of cars, airplanes, war machinery and we know that those models are very different from the real cars, airplanes and war machinery. We see pictures of cars, airplanes and war

machinery in magazines advertisements or even as adjuncts to articles on myriad subjects. We know that all of these items have complex and precise design documentation that we almost never see unless we are somehow related to the production or design process. All of this seems fairly obvious until we begin looking at the relations between these representations and repetitions and their transformational and mimetic relations. When we look then at the quadrate of the form schema and its interesting interrelations we realize that we really do not understand very well how these various embodiments of the product relate to each other forming the basis of the schematization process at the level of form. If we have a hard time understanding schematization at the level of form how are we going to understand it at the other levels that are more esoteric or abstruse. It behooves us to move out from the safety of the level of form slowly and to continually link back so we remain with a good grip on what we do know in the face of our ignorance. When we read Deleuze or Taussig and their explanations of the roles played by difference and alterity in repetition, representation and mimesis then we realize now unfamiliar the familiar can actually be.

It is interesting that we can relate to form schema to the non-dual of order. We are used to putting forms in order either in geometry or in algebra. Order is the non-dual between physus and logos. Form can be seen either as the word in a sentence or as the figure in a gestalt. It is order of grammar that gives a word its meaning in a sentence. It is the order of the forms in a system that gives the form its meaning in that context. We study contextless forms but we hardly ever see purely contextless forms. So external ordering effects internal ordering within the form. It is striking that we can rearrange the letters in a word and still be able to read it as long as the end letters are correct. Those end letters serve as the boundary of the form, its outline or shape, and the internal ordering of the letters does not matter much, like “ocne a woriarr deid wtih hnoor” as long as the context gives enough clues. We concentrate on the outline or shape of the form and little on the content and its pattern within that boundary. Order is brought to the fore at the level of form and as a non-dual it is tied to that level as its point of greatest articulation.

The Pattern Level of Schematization

It might be easier to go down first and consider the structure of the schema just below that of form. We want to bring into play what we know about the dimensionality of pattern, i.e. that pattern can be either one or two dimensional unlike form that is either two or three dimensional. So for representation we are going from the two dimensional pattern to the one dimensional pattern. And for repetition we are going from the one dimensional pattern to the two dimensional pattern. The best example we have of a one dimensional pattern is a thread and the best example related to that of a two dimensional pattern is a woven piece of cloth. We know it is a loom that takes us from the one dimensional pattern to the two dimensional pattern of colored cloth. It is not accident that it was the Jacquard loom that was the stepping stone to the computer. The sequential aspect of the computer memory is represented ultimately on a two dimensional screen. So in our computer technology this repetitional transformation at the level of pattern schema is till with us. But we have no general terms for these two different kinds of pattern nor of the transformation between them. But in general the cloth making industry starting from colored threads has something in common with the structure of the computer technology which is also based on the pattern schema. However, if we ask about representation where we go from two dimensional pattern back down to one dimensional pattern then it is much more difficult. For instance, the electron beam that paints the picture on the screen takes a two dimensional pattern in memory and writes it in

sequence of RGB colors across the screen, but the result is still a two dimensional pattern. The production of one dimensional colored thread like slices from a two dimensional sheet of some material is hard to imagine. Slicing is a mass like operation while weaving and braiding is a more set like operation. So we see entering here a form of the set/mass distinction that will have to be reckoned with. This shows that this pattern schematic level is very different from the form schematic level. Different concerns are organizing it. There are many processes that take two dimensional objects and slice them, but the result does not approximate something like the one dimensional thread in most cases. So right away we run into problems, and I think these problems will plague us all along our route. But if we don't continue to try then a general schemas theory will never be built. Besides the fact that there is no good example of representation other than the video monitor The interaction between the elements of the quadrate are not easy to conceive as they are for the level of form. So this is what shows us that we are entering a new territory. Various arts and industries have explored the dimensional transformations of various schemas but only within their own context and for their own purposes. We have to appropriate these examples and use them as metaphors for our own work of generalization necessary in building a General Schemas Theory. We have to strive to bring them to the level of clarity that we have in the schematization of form. But it may take a long time before this clarity is attained. In the mean time we can only make sketches and attempt to produce approximations to the structure of schematization at the various schematic levels constrained by their connection to dimensionality. As for understanding the meaning of the various schematic structures that is a very far off goal indeed.

One metaphor for slicing is the shredding of paper sheets. We notice here the fundamental roles that both paper and cloth have played in the development of civilization. Cloth of course came first which was woven. But the production of paper by the smashing of fibrous papyrus plants and then producing sheets of paper might be seen as the mass-like counterpoint to the set-like process of weaving. But here again we are talking about making paper out of paper by slicing the paper into shreds and then reducing it in order to make paper again. The analogy is not very good. But it is interesting that pictures tend to be drawn on sheets of paper, but sometimes on canvas, and cloth tends to be used in dress pattern designs that are then draped on models in the fashion industry. So we can see a kind of repetitional sequence from thread to cloth to dress pattern design plan to clothing for models. Similarly we can see a kind of representational sequence from buildings to pictures of buildings that are done on paper, to the shredding of paper to make more paper by slicing. The problem is that the slicing is not a representational transformation but a destruction that produces more of the medium and erases the picture.

But let us think about canvas making for a moment. In canvas making there is a weaving of threads into cloth and then that cloth is sized with something that makes it a white surface and this white surface is used as a basis for representing pictures. We take the pictures whether on paper or canvas and we scan them into our scanners which performs a kind of slicing in the process of digitization. The digital stream of the gif, jpg, or other file format is a kind of shred of the image. That shred of the image can be threaded again back into another application to recreate the image again. So it seems we really only go around this whole circuit with modern digital image technology. In this circuit the scanner is the representational transformation and the loom or printer is the repetitional transformation. Here there is a mixture between the pure image and the production of media. Technology has made it possible to separate the image from its underlying medium and the insertion into a new medium associated with computer technology

that includes scanners and printers. Perhaps the structure of the schema at the level of pattern is still to be clarified. Or perhaps I just have not thought of some obvious examples of representation and repetition at the pattern level. So we can see the difficulties that lie before us when we attempt to understand the structure of the schemas at levels other than that of form. We can only really afford to sketch possible structures using analogies from specific crafts and disciplines or industries. But it is clear that we have dealt with pattern and the movement from the one dimensional to the two dimensional and back again over the course of the development of culture.

Writing can be taken as an example. Letters and other symbols are mostly made up of conjoined lines. These lines produce two dimensional signs which become forms at the level of words. But if we just look at the letters then it is clear that we are taking one dimensional lines and forming two dimensional signs. In fact at the level of pattern we have differentiated four fundamental moments: i.e. sign, value, structure and flux. We write these letter signs on paper and then we read the lines of text, which is a kind of slicing or scanning. The shred in this case may be the letter, the word, the phrase, the sentence, the paragraph, or the textual fragment or the work as a whole. Based on our reading we then start drawing other lines to produce letter signs on new pieces of paper which then become other texts. This process is the core of our civilization. It circles around the schema of pattern fully alternating between reading and writing. And if we are to believe David Abrams in The Spell of the Sensuous it is this fascination with letters that has produced the metaphysical era out of the mythopoietic encounter with the otherness of nature, where our culture becomes denatured as just an encounter with texts. So in a way we can say that we understand very well the level of the pattern because it is the motor on which the construction of civilization by the sharing of texts becomes possible. We could then use Baudrillard's argument from The Critique of the Economy of the Sign derived from Bataille that there is always an overlap and strange relation between signs and values with respect to commodities. And that a similar relation is pointed out by G. Klir in his Architecture of Systems Problem Solving where he talks about the chiasm of Structure and Flux (using this word for process at the level of pattern). At the level of pattern the chiasm between flux and structure or sign and value or all four is the crucial issue that is brought out in the pattern schema's own ordering. So for instance in patterns of cloth our identity as tribes are woven. The patterns in the cloth are a sign of a clan, but also have implications in terms of social value as a part of a tradition and a heritage. Within the tartans of a clan there is a family resemblance which is a form of flux but the basic colors and the relations of stripes or checks to each other give a structure to the tartan. So it is possible to look at specific instances where the tartan participates in structure, flux, value and sign formations that are chiasmic, or interwoven. But we can also see that the pattern schema also has much to do with the relation of mass to set ways of looking at things. In reading we move back and forth between auditory and visual perception. Auditory perception is mass-like and manifests pervasion of sounds that intermingle while Visual perception is very set-like distinguishing kinds of things at a distance that are unmixed. Reading and Writing at the pattern level do mix mass-like and set-like aspects as we saw in the difference between paper and cloth. So in some way the pattern schema is mixed up with the set/mass distinction and their associated logics in an unexpected way. It is interesting to think that when we enter that schema we are at once thrown into the engine upon which our metaphysical worldview is based and that is constantly balancing between set and mass like approaches in spite of the fact that we exalt sets and hide mass approaches to things in our culture. Perhaps we understand this level of schematization better than appears at first glance, but we have made it unconscious to the

functioning of our culture, the hidden engine of our text based culture that the form schematization rides upon without realizing its importance and its integral functioning. Structuralism as a discipline unmasks this level of schematization and attempts to show how it functions in culture.

It is interesting that there is a connection between the Pattern level of schema and the non-dual of Chi or info-energy which is the inverse of Li or entro-matter. It is Chi that moves the elements of content around within the form. It is Li that gives the unique patterning to those contents. These are the non-duals that appear between physics and thermodynamics. Thermodynamics is the mass like behavior of everything excluded from particle or set-like physics. What exists between particles and thermodynamic masses is the introduction of mass/energy and info/entropy as a conglomerate, i.e. as inseparable. Patterns are generated out of this collision between the thermodynamics and the physics.

The Monad Level of Schematization

We are moving down the Ontological Emergence levels of the Schemas. Beneath the level of Pattern I posit that the next level is that of the Monad. This is what ever is designated as the smallest possible distinguishable entity, i.e. the smallest possible scale for a given purpose. In our scientific tradition we are continually pushing this horizon downward. The smallest scale we know of is the Quark, but Quarks are actually inseparable so the fundamental particle seems to the the smallest isolatable element. But now we are talking about strings that are in scale far smaller than the particle or even the Quark. However, for different purposes monads might be at different scales. Mostly for our purposes it is the smallest possible differentiation by the senses. But in science we have pushed far beyond this scale to scales that boggle the mind in terms of their smallness. But in science there are many scales that can be taken as monads for different purposes. The concept of the Monad as a schema is however that introduced by Leibniz and Democritus before him that there is some smallest thing out of which everything else is built whether it be sensory experience as in the case of Leibniz or it be a chunk of physical matter talked about by Democritus. The idea of a smallest building block searched for by reductionism is a fundamental idea in our comprehension of things. So the schema of the monad projects this idea of an atomic unitary smallest thing, at what ever scale we are considering smallest for the purposes at hand. For different purposes there will be different smallest scales that are relevant.

Understanding the monad schema is even more difficult than understanding the pattern schema which we struggled with in the last section. Normally what we would do is pick an ontic level of emergence and consider it as it was thought of when it was posited to be the smallest possible thing. So we can do that with atoms, particles, quarks, or strings. In some way each of these are images of what the monad might be like. But eventually it was discovered that there were ontic levels of emergence that was smaller than that which was designated as smallest at the time. It was the anomalies that showed up when reduction attempted to say that only that one level was the smallest that drove science on to further levels of reductionism. But at each level, for a while, that level was the monad that science searched for in vain as the holy grail of its eternal quest for the deepest secrets of nature. Each of the lower ontic emergent levels (atom, particle, quark, string) are images of what the monad might be like. The monad as a schema is the assumption that there is some smallest thing. We project this assumption on everything and out of that projection comes the various lower ontic emergent levels as we discover the anomalies related to each presumed lowest unified levels. In actuality it may be that there is no ultimate discrete smallest thing, that the very idea of a smallest discrete thing is wrong

in it self. Quantum Mechanics seems to suggest that possibility. Also Quarks seem to suggest that possibility since they can never be separated. But the projection of the monad seems to be a natural assumption we make that we cannot control projecting on our experience of things beyond ourselves. In many ways science is the history of the corrections of this projection by nature. The assumption of the monad is what drives reductionism. It says that there is some unity that appears in multiplicity. It abjures the contemplation of totality and does not reach toward wholeness. It is an assumption that is basic to Western Science which in many ways our study of nature has contradicted all along the way but which we cannot let go of because it is such a strong belief.

If we look at the monad as spanning both the dimension one and dimension zero and with respect to both representation and repetition, then we can see it both in physical and information terms. In other words we can start with the atom and see how it is repeated to produce the molecule on the one side while on the other side we can see how the DNA code that is built out of four molecules in groups of three can produce the representation of an amino acid. There are 64 codons which code for 20 amino acids that are the building blocks of all organic proteins. If we take out reversibility and substitution we get twenty sources within the DNA or I CHING heuristic 2^n level of complexity within the Pascal Triangle's unfolding. This is the level where two dimensionality can be turned into three dimensionality and vice versa without the loss of information. So amino acids are the atoms of organic proteins. DNA coding is a way of arranging specific molecules (GTAC). There is a mimesis between the atomic level and the amino acid level because both are the lowest levels in their respective related domains. The fact that molecules can be ordered into sequences to produce DNA coding causes a different kind of mimesis to occur, the mimesis between the data and information. Thus we can look at the whole monadic level in terms of information processing as well. In that case there is the bit which is repeated to produce the byte or word in memory. And there is an ASCII code that is the mimesis of that differentiation of the possible combination of bits. Each ASCII sequence is assigned arbitrarily a symbol and those symbols become the atomic level of our human interface with computing. The symbol is the atomic element for our human cognition of the computing environment, we write our programs in those symbols, and we read the inputs and outputs in those symbols in most cases. The byte or word mimics the ASCII code in as much as there is an assignment between the code and the 2^n combinations that are possible at the various levels of computational emergence (8bit, 16bit, 32bit and soon 64bit). It is interesting that we run into at the monad level the basic building blocks of information processing both in life and in computational machines. This might explain the powerful necessity of the projection of the monad. What the projection of the monad represents is perhaps the necessary substrate of information processing within the mind rather than in nature. We look for this substrate in nature without finding it because it is really an aspect of the mind. However, this does not really make sense because what we know of the brain's functioning makes it anything but a Van Neumann computing machine. But on the other hand it has been clear for some time that there is an emergent difference between the conscious mind and the brain's infrastructure and it could be that the monadic information basis only appears as an emergent quality of the mind and is not present in the brain as such. But of course this raises all sorts of other issues that we cannot address here. Suffice it to say there is a problem with the basis of information processing in life and in computation that is unsolved. We really don't know the role that DNA plays because there is not enough information in the DNA to control everything in the body, even taking into account the vastness of the information there is in it. We need something like the idea of an Active

Media[1] along with the DNA to produce all the complexity of the human body including the human brain. But DNA plus the active media of the cellular matrix gives us a way for the information to flow to drive genetic unfolding of organisms and evolution itself of different species. But exactly how this occurs is unknown to date just as it is unknown how the mind appears out of the brain. However, what little we do know is that somehow when we represent computational algorithms to ourselves we do so with programs that are written as coded ASCII symbols and we represent the computation itself as Turing machines. This level of representation we know are not what is happening in the brain itself, and we know that DNA is not just a program that is run by the cell, but that there is some interaction of an unknown type between the active media of the cellular matrix and the DNA that is replicated in each cell. The same DNA in cells in different parts of the body produce different kinds of cells. Somehow the identity of the DNA sequence plays off of the field of cells to produce specific kinds of organisms. We know that the difference in the DNA between Humans and Chimpanzees is not that great. So some other factor is coming into play than merely the DNA controlling the cells like a program. But what that factor might be is unclear. It may be some sort of implicate order in the cellular active media itself that is triggered by the DNA. Be this as it may it causes us to question deeply how our information processing model arises and why it is so close to the monadic schema and the structure of DNA at the heart of life. It is as if these two structures appear right at the heart of life and the mind which are both important emergent phenomena. They are emergent phenomena related to the Special Systems because the Autopoietic Symbiotic Special System has to do with the definition of life and cognition, and the Reflexive Social Special System has to do with the production of the social what assumes a theory of mind projected by each person on every other person that they interact with. What is missing here is the dissipative special system and we see that in the idea of the active matrix within which the DNA co-evolves. We know that the Schema itself is an image of the conjunction of the special systems. So in some way the Monad as an emergent level of scaling serves as a particular organization that is important to the emergence of life, consciousness and the social. Here we see the interaction of consciousness and the social as producing mind. Across the divide of mimesis there is the interesting appearance of coding and symbolism based on the substrata of the bits and bytes. This reminds us of the work of Damjan Bojadziev[2] who talks about coding as mirroring reflection and the relation of that to the Godel proof. I use his work as a major basis for my paper on "Reflexive Sociology". But it also applies here at the level of the monadic schema. Schematization at this level is about creating the building blocks of information processing out of lower level material to produce a free standing emergent level disconnected from what lies below it. This pulling free from the supervenient supports by moving into information processing out of physical processing is a key transformation, which then we project back onto other physical phenomena, perhaps wrongly expecting them to have the same independence that information shows. Information is a representation which is different from the mere repetition of the underlying bit patterns. In DNA we see this clearly because much of it is thought to be irrelevant to the specification of Genes. As Bateson said, what counts are differences that make a difference, i.e. meta-difference. Deleuze takes this further by talking about third and fourth level difference: differentiation and differenciation. Science concentrates on what is identical, or similar, and tends to ignore difference as does Western

[1] Brian Goodwin How the Leopard Changed Its Spots: The Evolution of Complexity (Orion Publishing Co, 1994)

[2] http://nl.ijs.si/~damjan/me.html

Metaphysics. Part of what we are trying to do in this series of working papers is to take seriously the critique of Deleuze and augment it with the insights of Taussig. Somehow at the level of the monad by imposing unity on multiplicity and ignoring totality and wholeness there is a production of a split which we can think of as the basis of the split that Descartes identified between mind and body (brain). Leibniz attempted to reverse this split by giving monads the power of sensation and cognition themselves. In doing so he produced an image of the Special Systems as we have noted in another working paper. Descartes discovered the relation between geometry and algebra while Leibniz discovered the calculus (at the same time as Newton). The sameness of algebra and geometry is balanced by the radical difference of mind and body and the skepticism that establishes the cogito. It is skepticism that is the pressure on the schemas while it is reductionism that is the pressure on the ontic levels of emergence. The monad is the ideal of finding the unified parts that do not need a whole but exist in a multiplicity not achieving totality. So the monad is the scalpel of reductionism. But it is skepticism that differentiates the various schemas from each other by attempting to collapse them together and failing. The mind views the sameness of the geometry and the algebra and everything else is extension. But extension, what Plato called the receptacle, is differentiated as the various schemas. To talk about extension without mentioning the schemas is to do the ultimate skeptical collapse to the projection of spacetime. In fact, the triangle of Pascal has both algebraic and geometrical interpretations and that is the generator of dimension. We can see the geometry of only the first three dimensions and after that we have to rely on algebra to help us intuit what higher dimensions might be like. Movements of higher dimensional objects are only seen as shadows at lower dimensional levels we have access to. The power of Descartes vision is that he unites geometry and algebra and gives that to the cogito as what cannot be doubted as what the cogito thinks about, i.e. mathematics. Because the cogito thinks mathematics it knows it exists. But the mathematics that the cogito thinks is a supremely unified mathematics that allows the geometrical thinking to confirm algebraic thinking and vice versa. This is what tears the cogito away from the body or brain. It is the synthesis that the cogito thinks that allows for the total separation from the cogito and extension where the body and its brain lives. Skepticism of the cogito is complete, in as much that it doubts everything that appears in extension. The only thing it cannot doubt is itself. Thus it doubts the existence of the schemas. Yet it does not doubt the existence of the dimensions taught by both algebra and geometry. So schemas are conflated and thrown into the plenum of pure extension and separated from dimensional unfolding. That is exactly the opposite of what we are doing in these studies. We are saying that extension as spacetime/timspace matrix is projected and that it is inherently differentiated into schemas and that those schemas are related intimately to the unfolding of dimensionality. In this we can see the radicality of what we are proposing with respect to what has gone before in the Western Scientific and Philosophical tradition. Descartes is the heart of the tradition. Husserl reaffirms this in his Cartesian Meditations. Descartes established the fulcrum of doubt that Archimedes said could be used to move the entire universe. That doubt is skepticism about what ever appears in extension. Extension is thrown away and reduced to an unimportant dual that is triumphed over by the cogito. Descartes in this way establishes dualism at the heart of the Western tradition more radically than ever before. After that it was hard for Kant to think about the schemas because they related to that projection of spacetime that Descartes rejected as having any meaningful structure. So Kant aligned the schemas with the categories and they remained an afterthought and an underdeveloped aspect of transcendental idealism. Even Husserl did not consider them very important. Only Heidegger began to recognize their importance

again as he explored their place in the Transcendental Imagination. All this unfolds out of the assumption of the monadic schema as primary and its use as the scalpel of reductionism. But what the monad does not give us is any insight into wholeness or totality. Jung for instance tries to redress this balance by positing the self as the totality of who we are and contrasting that to the unity of the ego, the monad at the core of consciousness. Jung pointed to the unconscious both personal and collective as the part of the ice berg under water that Descartes was sweeping under the carpet. Kant mentions totality along with unity and multiplicity in his dialectic of the categories. But the emphasis of the tradition is on unity not totality as Jung realized, not to mention the ignoring of wholeness. Leibniz too tried to counter the imbalance of the tradition with his definition of the monad as having sensation and cognition building a model similar to the special systems. There are many attempts to right the imbalance of our tradition but few of them had much impact on the cheord[3] of the tradition as a whole. Ours is another such attempt which depends on a definition of what Loy calls Nonduality as the basis of our critique of the Western tradition. Special Systems Theory is a modeling of non-duality using the resources of the Western Scientific and Philosophical Tradition itself. Notice that this schema of the monad specifically ignores wholeness and totality. This means that there must be something hidden in the schemas that is not appearing in our rendition of them. We can see the conjunction of the special systems at each schema level as the image of wholeness, i.e. a fragmented wholeness at the meta-level. But where does totality appear? It is not there in the atom, in the molecule, in the DNA coding or in the amino acid as protein building block. It is not there in the bit, the byte, the coding schema, or in the symbol. We can see a hint of it in the fact that all organic proteins used in the body are built from the twenty amino acids and so this is an implicit totality. Or in the ASCII code we can see that all the letters of the alphabet are there and so we can write any text in English with this coding scheme. So there is an implicit totality but not an explicit totality. This reminds us about the Gremas square and the unfolding of that square into the Gremas book[4] and cube[5]. In other words the contraries and contradictories that structure this schematic square may not be the whole story and in fact each quadrate could be only part of a larger synergetic structure like the Greimas book or cube. But to apply this model we would have to decide what is the A and anti-A as opposed to non-A and then propose that there is something that is non-anti-A. Then the Greimas book unfolds by recognizing the chiasm between non-anti-A and anti-non-A. If we could apply this model then we would discover a deeper structure in the schematic levels of ontological emergence. But it is unclear at this stage whether this expansion is warranted. What it would do is produce a stable structure for the schemas if it were in fact true. Cubes are stable and all space filling while the ladder of quadrates is not stable. This is the direction we were led in our study of "Reflexive Sociology." It would make sense that the social construction of schemas would conform to the reflexive structures that come from applying the various levels of reflection that relate to the special systems. In fact, that would be a very powerful synthesis of those two strands in my thought. However, at this point we can only point to this as a possibility, because no clear way to apply the Greimas Book and Cube[6] to the schematic quadrates leaps out at us. It will have to be food for later thought. But just on the surface of it we can see that totality and wholeness is not discussed in the framework that we are now considering except perhaps implicitly. So the non-monad would be the

[3] channeling

[4] This is my extension to the idea of the Greimas Square.

[5] This is my extension to the idea of the Greimas Square.

[6] Of course, Greimas never suggested that such formations existed. These are purely my extrapolation from his work.

totality while the anti-monad would be the multiplicity. Repetition takes us from monad to multiplicity. Representation takes us back down from multiplicity as a coding scheme to another form of unity, at a higher level of the symbol. There is mimesis between bit and symbol because both are unitary. There is mimesis between Byte and coding scheme because both are multiplicities. What is left in the background is the totality of words, of codes, of bits, of symbols. So if we open up that background and move toward it then we would see that the non-monad would appear as the totality that the unity is contrast to mediated by multiplicity as suggested by Kant. Normally the Greimas[7] square encompasses both non-A and anti-A as directions from A. Here we get another pattern where everything in the square is related to A and anti-A but at two different levels, i.e. in the reflection and in the reflected. That means that the Greimas squares are hidden behind the quadrate. There are two Greimas squares that relate the bit and byte to totality and another that relates the code and symbol to totality. If that is true then that means that also hidden is the chiasm of the anti-non-A. Now since we have two Greimas squares upended we might expect one to sport anti-non-A and the other to sport non-Anti-A. But that would mean that both would open up. And when they opened up that would mean that perhaps at that point they would turn into each other. That would mean that there were two books present and that when opened up they turned into each other. But the two books together would create a Greimas Cube. Mimesis occurs between the two books that make up the cube. This is an interesting picture that would next have to be reapplied to all the higher levels of the schema quadrates. But it makes sense in terms of completing the Kantian Categories. Wholeness comes from the bringing together the book and the anti-book in the Greimas cube. We know that the Schematic Levels are already consisting of the pieces of wholeness as the special systems. So all that is really missing is totality which must be the non-A in this case and hidden behind the apparent quadrate. So perhaps we do have at least a hypothesis as to how the schematic quadrate could hide the Greimas Books and Cube. Once we have these Cubes then we merely refer to the Reflexive Sociology paper to see how these stable structures can arise in higher order reflection. This is an unexpected realization. It never occurred to me that the totality was missing from the schemas. That only becomes clear at the level of the monad. Perhaps something different is missing at the higher levels. Perhaps that is why there is not just a meta-system representation of the **scape** schema but also an infra-system representation of the **scape** schema. This is an unexpected place to find a Greimas cube, and what is more amazing is that the square is partially hidden as the non-A part and the chiasmic part are eclipsed. It will take some time to figure out the ramifications of this hypothesis on the entire structure of the schema quadrates at every level. We cannot possibility hope to do that in this working paper. Here we must attempt to stick to the program as much as possible and explore the various schema quadrates one at a time to see how they are structured. But from this point forward we must take into account that each quadrate may be a face of a Greimas Cube.

The non-dual that is most like this monad level is that which produces spacetime which comes out of the relation between particles and anti-particles. We know that particles and anti-particles are created and destroyed below Plank's constant limit and that this roiling makes up the substance of spacetime. Of course spacetime and timespace form a matrix in which these two views are fused. It is in spacetime that unity, multiplicity, totality and wholeness is expressed. Ingvar Johannson says this is the most basic category. It is what Kant says is projected prior to the categories. Its projection is the basic nature of the schemas

[7] Greimas, A. J. "Elements of a Narrative Grammar." Diacritics 7 (1977): 23-40. See http://hypertext.rmit.edu.au/singing/essay/greimas.html

that differentiate spacetime as experienced by humans.

The Facet Level of Schematization

The next and last level that we will deal with going down to lower and lower levels of schematization is that of the facet. We have discovered that the facet exists because of the discovery of the quark and quantum phenomena. Actually we tend to only look for monads, but then once we discover the monads we realize that they are faceted before we posit a lower level monad. Sometimes the faceting is all there is as with quarks or quantum phenomena. So because some things cannot be reduced to discreet and distinguishable elements faceting must stand on its own as a type of schema just beyond the pale of discrimination. For that reason it forms the lowest level of the hierarchy of schemas.

But if we look more closely we must ask ourselves if the facet has a quadrate form like the other schematic levels. This is more difficult to apprehend than any of the other levels considered so far because at the facet level we are moving from zero dimensionality to negative one dimensionality. In other words we are moving into unknown territory. Previous working papers have dealt with the question of negative dimensionality already, so I wont belabor that again here. The negative one dimensionality is a singularity out of which opens all the other imaginary numbers and as we have said before those numbers are a model of interpenetration, so the facet dips into the sea of interpenetration. In some sense representation and repetition collapse when we reach that source of the negative dimensionality. It is this collapse that leads Deleuze in Difference and Repetition to define repetition as that which does not repeat. We could also define representation as that which does not represent. Ultimately both representation and repetition are opaque to us. It is in the facet that this impossibility of comprehending either representation or repetition comes to a head. What does it mean to transform in and out of interpenetration? It is unclear. Buddhist philosophy has been attempting to answer this question for thousands of years. Obviously that transformation is Karma, if we could understand what that might be. Karma is even more mysterious than Nirvana in many ways. One way to think about the facet is that at the lower bound of it, i.e. where it hits the singularity in negative dimensionality that this is where the x+x of two real numbers becomes the x+i of the complex numbers. In other words at that transition the symmetry breaking occurs that produces the imaginary numbers. Representation and Repetition become conflated and indistinguishable. Mimesis becomes the interpenetration itself in the singularity while at the level of the zero dimensionality it merely represents the void itself, as empty space miming itself. That empty space when seen as extension becomes the void of Taoism and when seen as the mind or consciousness becomes the Emptiness of Buddhism. When the Buddhists say the Emptiness is Interpenetration then they are talking about the relation between zero dimensionality and negative dimensionality in the facet. The jeweled net of Indra is an image from Buddhism of interpenetration. In that image all the jewels reflect each other in their myriad facets. We see this faceting as quantum mechanics in nature. We see it as the simultaneous holding of different states before the probability wave collapses. That simultaneity is supra-rational. We believe that quantum mechanical superimposition is the nature of the whole of the world both at the micro and meso and macro levels and it is the projection of Being that obscures this reality. The facet schema is the projection of this interpenetration on nature and consciousness. In other words we do not know if this non-duality is inherent to nature or consciousness or is merely a projection like all the other schemas. But what we can say about the facet schema is that it holds together both emptiness or void and interpenetration into a single

schema which is effused by the special systems. Here the reflexive mimesis becomes fused. Here the dissipation of order by repetition or representation loops the loop or goes through the twist of the mobius strip. Here the autopoietic juxtaposition undergoes a mirroring because we cannot distinguish the two sides of the negative dimensional singularity from which representation/ repetition emanate and descend. The special systems are together in the other schemas but at the facet level they become fused together like they are in the triangle of Pascal. This makes us wonder if when we reach the facet level we have really entered into the negative dimensional Pascal triangle that unfolds from the singularity of the negative dimensional endpoint of the schemas. Need we mention that also in terms of Greimas squares and books and cubes we can see that the Totality, Unity, Multiplicity and Wholeness all become fused in interpenetration as a non-dual between all their extremes. Interpenetration means that the multiplicity of things all are really one thing because they reflect each other and form a totality of all that exists that exudes a kind of wholeness described by the three jewels: Dharma (dissipative ordering) Buddha (autopoietic symbiosis), Sangha (reflexive social). However, the fusion of the special systems remain supra-rational and does not fall into paradoxicality or absurdity except in special anomalous instances.

The non-dual that is most like the facet is the uncertainty of quantum mechanics that appears in the difference between particle and wave and the other uncertainty relations that Quantum Physics has discovered. We can liken the facets to weak measures. When a strong measure occurs the quantum probability wave function is broken and specific particle results appear as determined by statistics based on experiment. But there is a way to look inside these uncertainty relations by making weak measures that allow us to peak through the veil into a speculative landscape of the unbroken quantum probability wave. Weak measures are explained in my paper on "Weak Measures and Autopoiesis".

Turning Around

We have reached the limit of our exploration of lower scales of the schemas. We have in this journey discovered that each schema has its own unique organization that needs to be understood separately from the other schemas. Now we turn around and begin upwards from the form schema and attempt to explore the larger scales.

This is more difficult because we will quickly begin to get to a dimensional overflow that we are not used to thinking about. Going downward to lower scales we encountered the singularity of negative dimension, which is strange, but as we go upward and encounter higher and higher dimensionalities this strangeness will be compounded as we recognize this particular aspect of the overflowing ecstasy of dasein. So in many ways the downward journey has been the easier one. Now we must prepare for the more difficult journey into higher dimensionality with seemingly no end in sight.

The System Level of Schematization

We have already discussed the Form schema previously that operates between the second and third dimensions. Now we will be going up a level in scale to look at the system schema that operates between the third and fourth dimension. A system is normally thought of as a set of objects with their relations. If this set of objects and their relations are static then it is a static system. But when we add time then it becomes a dynamic system in which the relations between the objects or the objects themselves change over time. So at this level it is clear that the primary interpretation of the fourth dimension is as time. There is a symmetry breaking between one dimension of time and three dimensions of space that replaces our view of geometrical four

dimensional spacetime. However, it is at this level when time enters the picture that we can start substituting the relativistic notion of spacetime or timespace matrix for the normal notions of absolutely separated space and time. So we can view systems relativisticly if we consider them to be in a grid of clocks, or the objects themselves to be clocks. Since measurements takes time to propagate and time signals take time to propagate then it could be that such systems become relativistic. However, these relativistic effects are not thought to have much effect unless we are moving at high speeds. However, even at low speeds sometimes it is not practical to have system wide clock pulses, or they cannot be trusted, in which case the same sorts of problems appear in the design of realtime systems that appear in relativistic phenomena of physics.

So the question becomes what is the relation between the three dimensional system and the four dimensional system and what are the images of them that appear related to representation and repetition. It is generally agreed upon that a four dimensional system is called dynamical whereas a three dimensional system is called a configuration of objects and relations considered statically. Thus the transformation of representation produces a series of configurations that approximate the slices states of the dynamical system. This is likened to freeze frame photography which takes very fast snapshots at some distance apart. It is much more unclear how to represent the three dimensional system view on the repetition side and how to transform it into a view of a four dimensional system. Let us grasp at straws for a moment and call the three dimensional system view on the repetition side a prototype. Thus there would be a mimesis relation between a prototype and a configuration. And let us be bold and call a four dimensional repetition of a prototype a simulation. The idea here is to use engineering as the model. In engineering many times bread boards or prototypes are produced that attempt to implement a configuration by bringing elements together into their designed relation. Then when we repeat the actions of the objects that make up the breadboard we get simulations of the dynamics of the system under design. These repetitions are called timeseries. In other words each object is allowed to produce its behavior within some time interval in concert within the prototype and then the interaction is stopped to see what happened. Sometimes there are probes inserted into the circuits on the breadboard to test for certain signals during the time interval based on given inputs and expected outputs. A whole set of these time series gives us a simulation under a particular scenario that specifies the configuration of the system and the occurrences in the environment. Simulations based on scenarios give us some picture of how the dynamic system itself might behave given a specific configuration in a certain circumstance. The simulation mimics the dynamism of the system. The breadboard mimics the configuration of objects and relations that make up the three dimensional system. Repetition gives us the timeseries within which behavior is seen. Representation gives us the freeze frame pictures of a dynamic system that we can compare to the timeseries repetition. By making this comparison we can get a good idea of the system itself is doing what we expect it to do in various circumstances. Normally we call this testing or verification. The breadboard and the simulation mimics the actual dynamical system given a specific set of configurations through time. But on the other hand there are transformations from the dynamical system which we cannot see into easily into the snapshots of the series of configurations on the one hand, and the timeseries playing forward of the breadboard into a simulation on the other. Freeze frame snapshots are the inverse of the timeseries successive releases of the breadboard into it's frenzy of interactive behavior. Going back and forth between the breadboard and its simulation on the one hand and the dynamic system and its successive

diachronic configurations on the other allows us to hone in on the design that exhibits the required behavior. One way is working up from components toward the working system as a whole which emphasizes emergence. The other way is working down from the working system toward the components which emphasizes de-emergence. It is the cycling between emergence and de-emergence that allows us to perfect our design. We really have to start from both hierarchical levels and work toward the other in each case. There is no way just to go methodically from the reductionist parts to the emergent whole. What is supervenient is the way that the emergent whole depends on the supports at the lower level of emergence. But there is always an emergent excess that appears where the whole is greater than the sum of the parts. That emergent excess becomes a de-emergent lack when we apply reductionism to the whole. De-emergence is what the deconstructed whole looks like from the lower level of the reduced parts if we look back up at it, at that point it looks a lot like a meta-system[8].

So if we apply our Engineering vision of the world then we can quickly outline what the various aspects of the quadrate at the system level might be like. Engineering comes closest to having a vision of the *system* because its whole purpose in most cases is the production of systems. We immediately think of configuration control, prototype systems, and simulations that we routinely use in Systems Engineering in order to attempt to approximate the behavior of the dynamic system before it is built. So the systems schema quadrate turns out to be very familiar to us. We understand the mimesis of the system by our prototypes and simulations. We understand how the configuration represents the steps of the dynamic system while the repetition of the timeseries allows the breadboard of hardware (and perhaps software) elements to produce a simulation of the dynamics of the proposed system. In test labs we work with these prototypes on a daily basis in order to refine the design and make sure that the various parts of the system fit together and work well with each other as they do in the design that appears on paper. When we move from the configuration to the buildings (products, components) then we are seeing a disassembly process. When we move from the models of the components or products to the prototype breadboard that combines those components or products then there is what we call layout. The opposite of dis-assembly is assembly where we put together a configuration, many times that involves integration of elements that have not been combined before. Layouts are initial tests of configurations of elements whereas assembly suggests manufacturing of the system. After the assembly there begins an operational test in which the dynamic system is put though its paces. Assemblies of designed components are forged together into the integrated system that is then given an operational test and ultimately placed in service. There is a reverse arrow to that of the freeze-frame of representation which is de-representation or construction. Similarly there is a reverse arrow to that of the timeseries of repetition which is de-repetition that is the testing of individual parts in situ within the breadboard in order to isolate the fault. It is interesting that the construction and probing are reverse arrows within the schematic quadrate. The normal arrows of representation and repetition give us the idealization of the relations between the different dimensionalities of the system schema while the reversed arrows give us the practical relations. It should be looked at whether these kinds of relations between arrows and their reversals hold for the other schematic levels as well. We have only been talking about the major arrow directions in this working paper so far. It might be a good idea to look at the reverse arrows in each case and to attempt to divine their meanings as well.

[8] See "The Foundations of General Schemas Theory" presented at CSER 2004 at http://holonomic.net

It is interesting that in terms of the non-duals the system is related to the right which is just the right distance between finitude and infinitude. Systems are gestalts and as gestalts they can only be seen at a certain scale by human beings. So in some ways the system is set by our human ability to perceive and our capacity to imagine systems of a certain scale. Thus Protagorus in this sense was right in the fact that man is the measure of things. It is man that decides what is the right size thing to be considered a system, and our root metaphor for the system is the organism or the herd of organisms. But now we see systems that are very large, as large as any collection of things that can have relations to each other. But this leaves it to man to decide what is the right scale for systems to be projected onto ontic phenomena. This rightness appears in the system by our selecting the right kinds of things and the right kinds of relations to include in our projected systems. The rightness of systems have something to do with our perception of wholeness. Certain kinds of things in certain relations can approximate wholes that are like organisms and others cannot and remain artificial totalities, unities, or multiplicities. This relation between the non-dual rightness being related to the non-dual schema is quite unexpected.

The Openscape Level of Schematization

This next level of Schematization has had a problem with its name for a long time within my theoretical work. Recently I realized that it might be represented with the word SCAPE as in Landscape or Seascape. But the word scape does not stand on its own as a noun. So searching for a way to have scape stand on its own I ran into the idea of using the term Openscape for what I mean by the meta-system or infra-system, or proto-gestalt, or proto-flow. Open refers to the open that is the subject of Closure in Hilary Lawson's book. It refers to the clearing in Being or opening in Heidegger's work. And it can be a word for an open variable for what is combined with the word **scape** to give it more definition. So this is the first time I have introduced that term for what I mean by the Meta-system in all my earlier papers[9]. An Openscape can be four or five dimensional. It is the next schema up from the System and it is the dual of the System. The openscape forms the enviroscape or ecoscape for the system. Up until I looked carefully at the term scape I thought our language did not have a word for this schematic level of emergence. But I was wrong about that. The word scape works very nicely. It has only the flaw that it does not stand alone. With the addition of the word open as a prefix meaning open to further definition it now stands alone and can be used very well to describe this schematic level in a way that is true to the English usages. When we stand at the system and look out from it in a panorama towards the horizon we are looking at the openscape, whether landscape or seascape that surrounds the system. That system stands to this openscape as if it were a nichescape, i.e. the openness of the surroundscape is to the system itself which the openscape acts as a closure upon. This usage of Closure is well explained by Hilary Lawson in his book by that name. Closure is a particular way of closing the openness of the openscape. He calls a particular closure a material, and each material has certain open possibilities of a certain type within it. There is a nested hierarchy of closures. Any of these closure levels can become open again in which case all more specific closures are opened as well. This opening of a closure and its reclosing is what Hilary Lawson calls an emergent event which produces new material with new open possibilities within it. The great thing about using the term Openscape is that it allows this terminology to be brought in that explains the relation between the system and the niches of the openscape. The openscape is open to the system in a specific way that acts as a filter on it based on prior closures. If the system does

[9] See Meta-systems as Escapements working paper at http://holonomic.net

not fit into the prior closures then the system is rejected by the openscape. Systems and their surrounding openscapes must be fit to each other. This relation is like the relation between a Turing machine and a Universal Turing machine, or like an application on a computer system and the operating system. Openscapes are not unstructured in many cases. They may have different degrees of structuring depending on their previous closures. The openness we are talking here are openness to possibilities and the closures are articulations of specific actualities that fulfill certain possibilities but not others. Systems must exhibit complementariy closure to the niches into which they are fitted. If they do not come close then they will be rejected or they will self-select to operate elsewhere.

In our definition of the openscape as meta-system, i.e. what is beyond the system, we will follow the systems engineering metaphor and attempt to define how the schema of the openscape is articulated into a quadrate by its relation to the forth and fifth dimension and by the representation and repetition transformations. To begin with we can see that a simulation may be run many times in a Monte Carlo fashion. This allows statistical averages of runs with different parameters to be compared and to give a response surface. The different runs will vary the conditions in relation to a scenario. So the iteration of the simulation under varying conditions produces a response surface in the face of a scenario. This is a vision of the repetition side of the transformation from the fourth to the fifth dimension. On the other hand we can conceive of a mission which might have various goals related to it that demands different modes to appear in the system which must be integrated. It is the composition of the various dynamic systems in various modes that gives us the integrated system. In this case integration means integration with the openscape within which the system must function in order to perform various missions. There is a mimesis between missions and scenarios at the fifth dimensional level. There is another mimesis between integrations and Monte Carlo results at the four dimensional level. Modes of a system are faces that the system must have to the openscape at different times in different circumstances. The dynamic system must integrate to the openscape in different ways at different times in order to achieve these integrative modes. It is the composition of the various dynamic systems faces that allows the system to achieve integration. It is iteration of the simulation that allows us to get the response surfaces of the Monte Carlo results. The fourth dimension is still temporality. But there the temporality is not from moment to moment but different runs of the same simulation at different times with varied inputs. Similarly modes allow the integration of various functions that appear as different faces of the system at different times which will allow it to pursue different goals in different circumstances. Modality allows us to approximate various missions that have completely different goals with the same system. Variation of initial or in-progress conditions allows us to approximate different scenarios that might be encountered within missions. The fifth dimension is represented not as time but modality or variation of circumstances. This dimension allows us to pursue different goals with the same system or it allows us to react and adapt to different scenarios some of which the system might not have been designed for or expected previously. If we think of the fifth dimension as variation of parameters or variation in time then we can begin to understand the nature of the openscape meta-system. Variation of time or qualities or quantities in space is a fundamental dimension that real-world systems have to deal with. When we look out at a landscape what we are looking at is variation. That is to say it is made up of different kinds of things scattered here and there in space, perhaps moving in time, sometimes these things are coming into being or going out of being. But the key things are the variety of kinds, count of

individuals, and their movement. Our system what ever it is must fit into this milieu, context, situation. Openscapes are sometimes thought of media. The system must be able to withstand and handle confrontation with what ever the media might contain given its rules of engagement. The openscape is an arena within which dynamic systems interact. It gives them their resources and allows them to interact and communicate. The openscape has a single boundary, the horizon. It is defined by a single point that is the center of the openscape when the dynamic system is not moving. That point of reference is what in fact is called the scape which can be a living stalk or a vertical post. To escape is to move from the scape toward the horizon. An escapement is a gear with a level that forms a clock, giving out easements of time in a continuous pace. Meta-systems are filled with clocks, each system is a clock due to its dynamism. But the escapement attempts to set a regular beat that determines the clocking of the freeze frames or the timeseries. The variety of the openscape is seen when one looks out from the scape reference point of the dynamic system and takes in the panorama around it. That panorama reveals variety of other kinds of systems, forms, patterns, etc, i.e. other schemas that resolve into kinds of things that resolve into individuals that eventually resolve into meanings for the system at hand. So the variety within the openscape is implict and the ordering of the interaction of the system with the openscape is implicit, this is why we say that the openscape has what David Bohm called implicate order. This implicate order unfolds as the particular series of gestalts that the system produces if it is an organism. The implicate order refers to how the system as a whole will operate in its niche within the openscape. Each kind of system within the openscape will have a different implicate order that unwinds as it interacts with the other systems within the openscape. But that implicate order would not appear without the interface between the system and the openscape. Animals in a Zoo are much reduced images of themselves, they only exhibit the full range of their behavior in their natural environment. The natural environment is the openscape for the dynamic system of the animal. Rescher says that it is the organism that is the underlying metaphor for the system. We treat organisms differently than artifacts in our cognition of them. Some[10] have likened this to the difference between the object oriented paradigm and the functional paradigm. If something is an artifact that is purely functional in its utility we will treat it differently and cognize it differently than something we treat as a living organism. We treat organism based on their kind while kind does not matter so much for utilitarian artifacts. It is as if all utilitarian artifacts had a single kind which we call their functionality which is the inverse of our intentionality. Our conflict is that we attempt to produce functional decompositions of systems from the top down, but we try to build up sets of objects of different kinds with relations from the bottom up. Emergence is suppose to happen somehow as a collision between these two approaches in the middle somewhere. An openscape besides its boundary and arena always has an origin, i.e. a point of origin of the openscape itself in its unfolding but also origin points for all the systems within it. It also has a source. That source is a template for all the systems that can appear within it but is also a template for the openscape itself. The source is outside the timespace of the openscape while the origin is the point of unfolding of the timespace of the openscape. When the openscape unfolds it produces a horizon or boundary and within that an arena. That arena has niches which systems enter as they arise from their origins. In a true openscape nothing moves. In other words once something moves then we have the next higher schema which is the domain. A domain is a set of openscapes with various different horizons. The world on the other hand is all possible openscapes with all possible horizons. So

[10] See Cognitive Fit paper at CSER 2004 "Cognitive Fit applied to Systems Engineering Models" Laurence Doyle and Michael Pennotti

openness continues to be a central feature of the higher level schemas above the openscape. We talk of open and closed systems. A closed system is closed to the openscape around it and influence from it. An opensystem is open to influence from the openscape around it. I have spent a lot of effort defining the openscape as meta-system in various of my papers so I won't belabor the point here except to point out that between the system and openscape there exist the special systems which are also worthy of study.

As has been said the non-dual most related to the Openscape is that of the Good, which is the production of Variety. This relation between the non-duals and the schemas is quite unexpected. It was writing this section that I realized there was a relation between the openscape and the Good as defined by Plato in the Republic as variety production. The best book on this is the one by Stafford Beer on The Heart of Enterprise. He argues that the human being always produces variety and that variety cannot be reduced structurally, which is another way of saying that it is an ecstatic overflowing that is prior to schematization, that the ecstatic overflowing of dimensionality of the schemas is a posteriori to existential overflowing that cannot be contained and analyzed by the schemas.

The Domain Level of Schematization

We recognized in the last section that the fifth dimension is that of variation in both space and time in both individuals and kinds. Now we enter a new level of schematization where a sixth dimension will be introduced. But like the proceeding level of schematization we will attempt to describe a quadrate that is split by the difference between the fifth and sixth dimension on the one hand and the difference between representation and repetition on the other. Here we begin to see the importance of representation. Representation allows us to simplify and reduce from a higher dimensionality to a lower one. This is quite useful when we cannot really visualize these higher dimensions. Repetition is the way we produce and fill out the new higher dimension. The new higher dimension has space for us to spread out into that was not available at the lower dimension. So there is some other space that is represented by the sixth dimension beyond variety. Our basic task is to try to decide what that could be that takes us beyond variety production, i.e. the Good as Plato taught it to us.

Basically we get to domains by moving in an openscape in such a way that changes our horizon and departs from the reference point of the scape. Domains introduce differing viewpoints. I can come stand where you are standing and see the same thing and adopt the same horizon. Domains are the organization of these disparate viewpoints, normally with rigor into a discipline. We represent those disciplines as departments in the university. Systems Engineering is one such discipline that Industry wishes to introduce into the University, which is already established in industry, i.e. it wishes to transplant itself from the physus to the logos side of the barrier in our society. If we wish to extend our layers of schema up to this higher level attempting to remain within the bounds of our Systems Engineering discipline then what we see at the domain schema level is how a set of scenarios that appear at the openscape level become strategies at the domain level. From the domain level scenarios are considered tactics. On the other hand the various armed services play different roles in war and offer different capabilities to perform missions. So on the repetition side of the domain schema quadrate there is at the fifth dimension strategy while on the representation side there is the roles that the various services play. A strategy is repeated to become a vision. For instance, Donald Rumsfeld has the vision of transformation of the military. This repetition of strategies from different

viewpoints which appears in military gaming gives us a vision of our militaries ability to wage war. The vision of how we wage war is what the current Secretary of the Military wishes to change. On the other hand the roles of the military services flow from their capabilities. Capabilities are based on the testing of our attitudes of our soldiers in actual combat, not just on technology, not just on planning. Here we are talking about the resilience, adaptability, courage, cunning, and other military virtues that come out of the testing in the midst of the fog of war. All this is created given the raw material of the recruits by the rigor and discipline taught to the troops in their training. That attitude might be made up of a lot of different aspects, like comradeship, honor, wishing to live up to tradition, the pursuit of excellence, etc. Attitude is not a good word, we must continue to search for a better word. Perhaps it is called readiness to fight. But there is a mimesis between this readiness or attitude and our vision on the one hand and a mimesis between our roles and our strategies on the other hand. Capacity is the representational transform from readiness or attitude into our fulfillment of our roles. Variation of viewpoints is what is repeated in order to get from our strategies to our vision. A lot of times this attitude or readiness is encapsulated in the term leadership. It is what will allow us to continue to move forward in the face of the enemy engulfed by the fog of war. And it is this leadership that is instilled in each fighting man and woman that will determine our fate and the fate of our society ultimately if history is any basis for judgment. So the various services are like the departments of the university of the army. The army is in the realm of human physus what the university is in the realm of human logos. It would be interesting to find a good word for what I am calling attitude, readiness, or leadership. Perhaps the term Poise would be a good one. We need both poise and vision. Poise determines our capacity to act within a defined role. Those roles are integrated by a strategy which is formulated based on a variety of viewpoints that produce an overall vision that directs our war fighting and determines our poise in the future.

If we bring this out of the military metaphor and apply it to systems engineering we can say that Eberhard Rechtin sees the System Architect as the person with the vision. But his vision is worthless unless we are poised to perform our roles as systems engineers and have the capability to do the work involved. That work demands that we execute to a strategy that takes into account many different viewpoints, that is why the IPT has been formulated as the ideal basis for organization for development of products. But unless the IPT has a common vision then chaos will reign. There is a loop at the domain level that allows us to control our movement in battle, or in systems development and manufacturing that supports battle, or in commerce. Many different perspectives need to be fused into an over all vision. But we must be ready, poised for action, in a way that we can take advantage of the opportunities and respond to the crises that emerge. Poise mirrors our vision, just as strategy based on different viewpoints mirrors our capacities and roles. In some way this schema of the domain determines our fate because the world is so uncertain. As we go over that horizon established by the openscape we just don't know what we will find. The domain with its rigor and discipline attempts to prepare us to deal with the crossing of any horizon, but due to anomalies that may cause emergence either externally or internally it is always a risky business. The risks of confronting the world in all its unknowns is what the domains have built up rigor and discipline to counteract. They are not always successful. Systems Engineering seeks to be a domain with its own rigor, foundations, methods, tools, processes, etc in order to deal with the risks of product development for large complex emergent systems. We need not just a vision for the future of Systems Engineering but also some way to gain poise so we have the right attitude,

readiness and responsiveness, as well as leadership to forge forward in the midst of this potential unknown of higher and higher emergences of more and more global systems.

The non-dual related to this level of the domain is fate. It is the reason we set up disciplines with rigor to try to gain some control over our fate. That is why the military metaphor is so apropos. Fate is the non-dual between existence and non-existence. Either a large scale emergent system is possible or not. When we try to build one we are testing fate. If we succeed then that possibility for emergence existed in the nature of things, like the ability for horses to be big. Indo-Europeans bred large horses and reaped their power, but that possibility had to be genetically present for it to be brought out in that way by genetic engineering through breeding. Engineering is always pushing the limits of what is possible and attempting to create existence proofs and those existence proofs tempt fate. When large bridges, or dams or other large scale engineering structures collapse then we know that we have gone to far and tempted fate once too often, but then we dream of another bigger system and another way of approaching it and we try it again.

In the domain level the sixth dimension appears. The fourth dimension was time and the fifth dimension was variety. At this level there is some relation between the sixth dimension and fate. We have called these sixth dimensional attributes of the quadrate poise and vision. There are many visions and many postures. But these are our own, not those of other things. Humans are variety producers according to Stafford Beer but there is also variety naturally occurring in the world. So some way the sixth dimension has to the differentiation of our vision and our poise in the world which we build up though our creation of domains, concatenated and concentrated coherences of viewpoints. We might call the sixth dimension human variability within the overall variability of things. It is that human variability that determines our fate along with our interactions with our world.

The World Level of Schematization

Worlds are all possible horizons taken together. Domains are just some coherent subset of possible horizons taken together. So worlds encompass everything and that is why Heidegger spent so much time defining the world as a basis for fundamental ontology. Fundamental ontology relates the things in the world to the totality of the world. But it must also deal with all the viewpoints of dasein which projects intelligibility onto the things as well as themselves. When we reach the level of the world schema then we are going to see a very different landscape with respect to representation and repetition at the level of the sixth and seventh dimensions. When we are talking about the repetition part of the quadrate at the sixth dimension level then we can see that the coordination of our visions leads to a constellation. I mean this term in the way that Walter Benjamin uses it and which Adorno borrows. A constellation is something wider than a vision, it is a way of seeing everything in the world. Brian Cantwell Smith in his book The Origin of Objects has an interesting way of thinking about the world in terms of registration. Registration is something beyond intentionality. Registration is the way we intend things we do not immediately have in view. To do that he says we must have a tracking simulation of the things in the world that we register. This overall registration of everything is what the world is which is a much wider world than Husserl concerned himself with and in some senses is wider than even Heidegger's vision of the world. Registration gives us a specific way to think about how we relate to everything in the world that is not present to us or to anyone else. In other words viewpoints only go so far, there are things that are absent to all viewpoints that are part of the emergent whole of the world that eludes even the domains. To get at those things we need registration or something like it. The world is

the totality of everything registered. On the representational side there is replenishment of the reserve by sourcing. So there is mimesis between the reserve and the constellation. There is mimesis between the tracking simulation of the whole world and the replenishment. There is mimesis between the sourcing and the registration process. The reserve provides resources for us to be prepared and ready or poised. Without a standing reserve we cannot be prepared and ready. Our visions are coordinated in the constellation of all possible visions. Those visions are truly visionary if they reach out with registration to imagine the world that cannot be seen from all the perspectives and provide a tracking simulation of that world which means a tracking simulation of everything within the world, all beings that are projected, including those that are absent. The world is not just make up of what is present to viewpoints but also what is absent from viewpoints and also what is absent from all viewpoints, what Michael Henry calls the Essence of Manifestation.

The non-duality related to this level is the sources. The sources are the templates of things that appear in the world that are outside the boundary of the world considered as the ultimate human meta-system or openscape. These sources are the templates of understanding but also the templates of creation from which actualization proceeds. What is actualized comes into being from these sources. Ibn al-Arabi calls them the Ayn al-Thabita.

The world revels the seventh dimension. We understood that the sixth dimension had to do with human variability. But the world is more than merely human variability within a world of natural variation. There is a non-human variability in the world which overwhelms us and encompasses us and makes us ubermen in Nietzsche's use of the term, when means men of earth, something more basic than human. Heidegger talks about world and earth and how they come together. He talks about the fourfold of Heaven/Earth, Mortality and Immortality. We have discovered in The Fragmentation of Being and the Path beyond the Void the negative fourfold which is Night, Covering, Chaos and the Abyss that matches the positive fourfold that Socrates articulates and Heidegger takes up and champions. World is something inhuman. It is something that arises from the sources that are more than human to give us a human world that immerses us. The world has to be more than human to encompass the humans within it. Something which is the intentional product of something like what Desan calls Planetary Man. The seventh dimension is that non-human basis out of which the human world is actualized.

The Kosmos Level of Schematization

As we go up to the next level of schematization we must remember that we are in the Metaphysical era and it is only in this era that the Kosmos has come into view as the subject of physical philosophy starting with Anaximander. He inaugurated the metaphysical era with four inventions, the map of the world, the model of the kosmos, writing in prose, and the positing of a metaphysical principle Apeiron. So when we move up to this schematic level we are really entering a segment of the metaphysical era which might be different in other philosophical-historical eras of human endeavor. Today there are many calls for the end of "Man" and the Metaphysical era including that of Heidegger in his book Contributions to Philosophy. But as far as we know this is an example of what Nietzsche calls the last man, the precursor to the uberman who is full identified with the earth. At the World level we identified replenishment and the tracking simulation of everything that is registered as the two seven dimensional aspect of the quadrate of world schematization. Of course, replenishment must be based on prospecting out in the exploitable physical universe which is made available by

economic colonization of the universe as a source of the resources we need to keep our economies going and our lifestyles in our lifeworld in tact. So this is the representation leg of our view of the kosmos. We take what is given to us and we represent it to ourselves as useful and then use it. This is part of the destruction that fuels human creativity as we dissipatively order the universe to produce an environment that supports our life. On the other hand there is the repetition leg of the schema where the tracking simulation of everything that is registered gives us a way to leverage the markets we create and these markets together produce the effects of globalization which may some day be called solar-system-ization as we reach out into space and establish markets on the various planets and space colonies. We attempt to leverage the inefficiencies in these local and global markets in order to produce wealth. But we can only do that by using our ability to do tracking simulation produced by the world as a synthesis of all viewpoints. In markets these viewpoints fuse into pricing information of stocks, bonds, commodity futures and other financial instruments. There is real wealth and there is artificial wealth. Real wealth comes from new gold, diamonds, and resources pulled out of the ground. Artificial wealth is everything else that we see has having value. The difference is that real wealth is not effected by inflation. The price of gold and the value of currencies fluctuate but gold itself is the standard. For diamonds there is an artificial scarcity produced by a monopoly so that does not actually provide a standard. But the general scarcity of gold and its immutability does provide a standard. Our economies have disengaged from that standard and have become virtual economies based on artificial value production of various financial instruments that have been invented. So at the kosmos level analogous to Anaximander's map is the globalization, or economic domination of the globe. This globalization of markets provides us with the free running production and destruction of artificial wealth. And analogous to the model of the kosmos that Anaximander provided is the picture of the universe as the source of real wealth that is brought into use by prospecting which allows us to replenish reserves. Markets are repeated until we produce a global or solar-system-wide market. Replenishment through sourcing represents new sources of resources to be taken into the global reserve. Of course, a major question is how these resources are shared across the globe, and how the markets dominate various peoples who do not share in the generated wealth. The key point is that at the Kosmos level there is a writing on the planetary surface as we do our replenishment of reserves which includes the production of industrial wastes and the destruction of the planet and it's ecosystems. There is the writing that allows the market values that are created and destroyed to be stored giving the illusion of artificial wealth. Most of this is done in computer memories rather than with money tokens these days. And there is also the appearance of the metaphysical principle. After Parmenides the metaphysical principle was Being, the ultimate paradox or absurdity arising out of projecting perdurance on the changeableness of existence. But in the time of Anaximander the metaphysical principle that he posited was the Apeiron which means the unlimited. Thus he posited the difference between finitude and infinitude as the basis of the metaphysical. He also posited models and maps of the physus and compared those to written descriptions which were embodiments of logos. Anaximander posited the basic structure of our metaphysical world in his inventions. And it is the extension of those distinctions downward and upward that gives us the series of duals which allows us to define the non-duals which we have associated with each level of the schematization. At this level the non-dual is the root which is beyond and before manifestation and non-manifestation. What can be replenished and the wealth that can be created are what is manifesting, that which does not manifest cannot be replenished and created as wealth. At the kosmos level the

basic process that is occurring is manifestation. We also posit that the eighth dimension that is revealed at this level might be labeled the non-human. In other words the kosmos reveals to us what is non-human as opposed to the inhuman functioning of the world schema itself which goes beyond or overreaches the human by its crowd like nature as described in E. Cannetti's Crowds and Power. The kosmos determines how we relate to the non-human universe which is beyond the inhuman social forces that dominate the world. If an asteroid plows into the earth and kills us all as it did the dinosaurs then this is a Kosmic phenomena not a world phenomena. World phenomena only go as far as human beings in their behavior effect things. For instance the destruction of the earth is a world phenomena, but the fact that the earth has resources to use or misuse is a kosmic given. The Kosmos manifests to us and leaves a lot of itself unmanifest. Science attempts to explore the Kosmos and to see what is out there but we are limited by some fundamental limits like the speed of light from exploring too far beyond our solar system. We call the non-dual involved here the root, because without the universe existing there could be no sources of different kinds of things. The existence of the universe is a fundamental prerequisite for life as we know it and we call this the Anthropomorphic Principle that we know the universe because it makes life possible. If a few constants in the Kosmic equation were slightly different we would not be here to be conscious of the universe at all. So the manifestation of the universe is made possible by the root actuality of its existence.

The Pluriverse Level of Schematization

The final level of schematization that we know about is that of the Pluriverse. It is interesting that the series of non-duals and duals come to an end prior to this level. The series of duals and non-duals form the world tree Yadrassil and so at this level what we see is the earth that this tree is planted in. What is beyond the uncertainty of the facet level is the sky or heavens of interpenetration. But below the tree of the world is merely the earth from which it takes root and grows. The tree itself represents dukkha, mara, maya, or dunya, i.e. the basis of projection itself as schematization, the first projection. The ninth dimension that appears at this level is what is truly alien to us beyond the inhuman of the mob and the non-human of the manifest universe and the globalization of markets. If we look at the concept of the Pluriverse it is by definition unknown. It is a hypothesis of many worlds which is the simplest hypothesis of Quantum Mechanics. It is articulated very well in the Fabric of Reality by David Deutsch. David K. Lewis talks On Plurality of Worlds from a logical point of view using the concept of modality. So the many worlds that make up the tree of the world Yaddrasil are in some sense the earth in which that tree is planted. The tree of the world makes those worlds manifest by a series of closures based on duals and non-duals that are selected at each stage of unfolding. What is interesting is that the representation and repetition split boils down to the difference between the past and the future when we look into the relation of the current universe and the plurality of universes posited by the many worlds theory. In other words there are many possible pasts that congeal into the represented past of this universe. On the other hand there are many possible futures which our projected future splits into to produce the many other universes that are future worldliness of our universe. David Deutsch makes the point that the interference pattern between all these possible universes that are all real is the quantum uncertainty, so that the pluriverse takes us back to the uncertainty that appears at the facet level of schematization. The tree itself of schemas related to the structure of the metaphysical world is the interspace between this congealing of existing real other universes and the spitting into many future universes due to the different quantum paths that may be followed when the probability wave is broken. Of course the non-dual state remains if this probability wave is not broken. The dualities all appear when the probability wave is broken. It

is undecided whether the probability wave is broken or not so that non-duals and duals exist together. What is *Alien* is what lies outside the light cone of our set of universes and their possible congealing and splitting. The truly alien is what appears at the ninth dimension and what is beyond that is utterly unknown. The dimensional ladder keeps going upward, but we cannot imagine a schematization beyond the pluriverse. The pluriverse seems to be a natural limit to our ability to schematize spacetime because it is the origin of the universes that contain different spacetime bubbles. Perhaps Lee Smolin is right in The Life of The Cosmos that the pluriverse is the realm of the evolution of universes and that every black hole is a universe of a different parameter set. Perhaps our universe is merely within the black hole of another universe. It is impossible to say despite how interesting the ideas are, we will never know because by definition we cannot test the premise that there are plural universes, unless of course quantum computers can compute things that should not be computed in our universe as David Deutsch conjectures.

The Pluriverse schema somehow concerns how we navigate in the matrix of possible worlds as we move from the congealing of potential previous worlds to our own to the splitting off of the many future worlds from our own. Representation has to do with our view of past possible worlds with alternative histories near the history of our own, if we knew it. Repetition has to do with the splitting off of possible future worlds that might diverge from our own, if we could know them. Our universe actually only exists in this instant of symmetry breaking when the probability wave collapses, but it is the same as all the other possible worlds both past and future and present if the symmetry breaking does not occur, because without the symmetry breaking of the shattering of the probability wave the existence we inhabit is all possible worlds past, future and present simultaneously as a field. That non-symmetry broken world does not give rise to the tree Yaddrasil. It is the same as the quantum mechanical superimposition of states that appear at the facet level. In that case the space between the pluriverse and the facet level does not exist for the other schemas to differentiate themselves into. In that state all the various schemas become complementary with their duals. Thus Pluriverse and Facet is complementary. Kosmos and Monad is complementary. World and Pattern are complementary. Domain and Form are complementary. Openscape and System are complementary. These complementarities all appear as the quantum mechanical complementarities as the schemas arise as an autopoietic ring from the un-symmetry broken state into the symmetry broken state. That ring is autopoietic in as much as each schema is the conjunction of the two adjacent schema. But they are reflexive in as much as they these complementarites of highest and lowest scale exist. They are dissipative ordering to the extent that they are projections out onto the ontic levels of emergence in the physical world. In other words the schemas as a set exemplify the characteristics of the special systems. But we have seen here that each schematic quadrate also combines the characteristics of the special systems. We have also seen that the non-duals of the Western worldview are articulated at the center of these quadrates and that each schematic level is associated with one of the levels of duality in the differentiation of the Western Worldview. This relation between the schemas as a hierarchy and the levels of duality and non-duality of the Western Worldview is quite unexpected. It means in some way that the quadrates of the schemas is the infrastructure that separates the duals at each level from the non-duals at that level. The duals are outside the quadrate and the non-duals are at the center of the quadrate so that the quadrates of the schemas form a scaffold that holds the duals and the non-duals apart yet together.

Unexpectedly the exploration of the structure

of the schemas has helped to clarify the structure of the metaphysical worldview. It has helped to fill in the missing link between the duals and non-duals that keeps them apart yet together at the same time. It is very unexpected that there is a relation between the schemas and the non-duals. It really only popped up as I tried to explore the structure of the meta-system schema and it became clear that it had some relation to the Good. Then I went back and checked and found that there was a parallelism between the schemas and the dual/non-dual distinctions that I have made in other contexts as the inner structure of the Western metaphysical worldview. So I went back and added those notes into each section to specify that relation including the attempt to specify the operative difference that was contributed by the additional dimension.

The End of a Long Road

This is actually the end of a long road that has been traced by my various working papers on General Schema Theory. I set out to understand the schemas and their relations to each other. The theory proposed here is a first cut at such a theory that shows that the schemas have an inner structure and they form a chain with transforms within the schema and between schemas. Folding this new infrastructure into the external structures posited in my first series of papers about the schemas will be a job in itself. But in a way no matter how many other papers I write in this series this is the end in as much as it posits an inner structure to the schemas based on their differentiation due to the connection to division posited in the first paper of this second series. I can refine this infrastructure of schematic quadrates. I am sure that there are many points that can be improved. But the basic idea that there is an inner structure based on the relation with dimensions and the mimesis between representation and repetition stands as the endpoint that I hoped for and now have found for understanding the inner structure of the schemas. I had no idea when I started that the discovery of this schematic infrastructure was possible. The fact that it turns out to explain the relation between duals and non-duals in the Western worldview is a additional unexpected gift. It is clear that the quadrate of each schema is unique and represents an emergent level with its own emergent properties. The relation between the schema quadrates and the dual/non-dual articulation of the worldview gives these schemas an importance within the worldview and puts them in a context that gives them significance to our lives. Living in the worldview means we are projecting the schemas. That projection separates the nihilistic artificial dualities from their associated non-duals that we demark by non-nihilistic distinctions. In some way the demarcation of the non-nihilistic distinction is the centering of the schematic quadrate within the context of the duality. Who would have thought that the differentiation of the progressive bisection of the tree of Yaddrasil would be related to scales of projection. Man being the measure of all things depends upon the space for Yaddrasil to grow to be opened up by the symmetry breaking of the collapse of the probability wave. When man measures all things then the difference between the nihilistic artificial dualites opens up and the non-dual appears before and between those dualities. Applying schemas to phenomena of different ontic scales sets the measures of man against the phenomena and that causes the proliferation of the world as a progressive bisection of nihilistic duals secretly connected by designated non-duals at each stage of symmetry breaking. In a way this suggests that the symmetry breaking occurs in stages rather than all at once. The opening up of the world appears in the space between the quantum superimposition and the possible worlds both based on the collapse of the probability wave. This opening occurs by stages as the entire set of schemas appears first as a bifurcation between system and openscape, then as differentiations of these two that are folded, then as a hierarchy which is an autopoietic ring. As the opening occurs then we see the non-duals appear in relation to

the dualites and we explore their relation to our humanity and finitude at the various levels of articulation. It is as if the dualities and non-dualities are the blowback from the projection of the schemas. We project the schemas on the ontic hierarchies and as a result we see the articulation of our world as the dualities and their associated non-duals.

The schemas do have an inner structure. This is an approximation of it. Hopefully this approximation will be refined by myself and others. Schemas are the core of the Western worldview differentiating non-duals from duals. By the projection of the schemas we learn both about the duals and the non-duals. Our worldview is deeply integral and schemas play an important part in that synergy of the worldview. Each quadrate indicates the non-dual at its appropriate level by the emptiness at the center of the quadrate. It separates the duals at its level and exists as a social projection of the Greimas cube which is a social construction[11].

[11] See Reflexive Sociology presented at 2003 Socialtheory.org conference

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