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SIG: What is Life and Living?:

Defining Life And The Living Ontologically And Holonomically

(Not necessary to prioritize) [edited and corrected]

SIG: Research Toward a General Theory of Systems:

New General Schemas Theory: Systems, Holons, Meta-Systems & Worlds

(Priority 1, highest) [edited and corrected]

SIG: Duality Theory:

Intertwining Of Duality And Nonduality

(Priority 2) [edited and corrected]

SIG: Processes and Human Processes:

Holonomic Human Processes

(Priority 4) [not edited]

SIG: Spirituality and Systems:

Genuine Spirtuality And Special Systems Theory

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SIG: Living Systems Analysis:

Not Written

(Priority 5, lowest)

SIG: What is Life and Living?

ABSTRACT

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DEFINING LIFE AND THE LIVING ONTOLOGICALLY AND HOLONOMICALLY

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The distinction between "Life" and the experience of "Living" is a variety of subject/object dualities. In order to understand what it means deeply, we need to move through the meta-levels of Being because the distinction takes on a life of its own as we go up through the thresholds of the meaning of "living life" when the subject/object distinction breaks down and successively reveals deeper and deeper levels of significance. Finally, we reach a level that is unthinkable in which we become immersed in complete nonduality. But at that level, things become more clear when balancing the successive obscuration of the meta-levels of Being. At this fifth meta-level of Being, we encounter something different which is Existence. Existence has its own structure which defines life, the social and the negatively entropic thermodynamicism. We find that these Holonomic non-dual structures reach around to define the levels of Being themselves. We get a picture like that of Escher of two hands drawing each other. This is the picture of the symbiotic nature of Being and Existence. In that symbiosis living, the social and the thermodynamically negative-entropic are defined in existence where they could not be defined in Being. (What is Life and Living? Special Integration Group)

DEFINING LIFE AND THE LIVING ONTOLOGICALLY AND HOLONOMICALLY

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SUMMARY

The distinction between "Life" and the experience of "Living" is a variety of subject/object dualities. In order to understand what it means deeply, we need to move through the meta -levels of Being because the distinction takes on a life of its own as we go up through the thresholds of the meaning of "living life" when the subject/object distinction breaks down and successively reveals deeper and deeper levels of significance. Finally, we reach a level that is unthinkable in which we become immersed in complete nonduality. But at that level, things become more clear balancing the successive obscuration of the meta -levels of Being. At this fifth meta -level of Being, we encounter something different which is Existence. Existence has its own structure which defines life, the social and the negatively entropic thermodynamicism. We find that these Holonomic non-dual structures reach around to define the levels of Being themselves so we get a picture like that of Escher of two hands drawing each other. This picture illustrates the symbiotic nature of Being and Existence. In that symbiosis living, the social and the thermodynamicly neg -entropic are defined in existence where they could not be defined in Being.

Consideration of the distinction between Life and Living takes place in the context of a broader theory that extends General Systems Theory by looking at the theory of General Meta-systems and between them sees the existence of Holonic Special Systems. Meta -systems are seen as being produced by the interaction of normal systems and the holonic special systems which is called an Emergent Meta -system. Special Systems Theory and Emergent Meta -systems theory as it appears in the paper *Reflexive Autopoietic Dissipative Special Systems Theory*¹ is precisely about the nature of life and the living. It is a theory based on the work of Ilya Prigogine² on neg -entropic dissipative ordering structures and Humberto Maturana and Francisco Varela's³ theory of autopoiesis⁴ as well

¹ The paper may be found at <http://server.snni.com/~palmer/autopoiesis.html>

² Kondepudi, D. K. with Ilya Prigogine, *Modern Thermodynamics: from heat engines to dissipative structures*. Chichester ; New York : John Wiley & Sons, c1998. Also Glansdorff, P. and I. Prigogine. *Thermodynamic Theory of Structure, stability and fluctuations*. London, New York, Wiley-Interscience [1971]

³ Maturana, Humberto R. and Francisco J. Varela, *Autopoiesis and Cognition: the realization of the living*. Dordrecht, Holland ; Boston : D. Reidel Pub. Co., c1980.

⁴ Mingers, John. *Self-producing Systems: implications and applications of autopoiesis*. New York : Plenum Press, c1995.

as the theory of John O'Malley⁵ and Barry Sandywell⁶ concerning reflexive social theory. The theory rethinks the concept of the living as self-organizing machines developed by Maturana and Varela and places it in a social context. It shows that living things function in the interspace between systems and meta-systems as embodiments of special anomalous systems defined by hypercomplex algebras. Living is an emergent property that exists at the next higher level from the emergent properties of dissipative neg-entropic ordering systems as defined by Prigogine. At the next higher level beyond the living is the social level of organization which is fundamentally reflexive in nature. Within the multi-cellular organism, all these properties are balanced against each other. Cells are dissipative neg-entropic ordering structures in terms of energy balance. But they are autopoietic in terms of information balance and reflexive in relation to other cells in the body. The same structures again are balanced against each other at the level of organisms which form social groups. The important thing about special systems is that they are ultra-efficacious (ultra-efficient and ultra-effective) such that once life appears, it takes over and spreads everywhere taking up all the various niches in the environment which it transforms by its presence. This factor of ultra-efficaciousness is what makes living things stand out from the rest of nature so that wherever we look on earth, there is life even though we do not see signs of it in the immediate vicinity of earth. This paper and others presented along with it at this conference will lay the foundation for showing how living social beings that embody special systems are embedded in the larger ecosystemic environmental meta-system which appears to be formed on the model of the emergent meta-systems that are made up of the interaction of the special systems. This forms a basis for a new understanding of the nature of Gaia as the planetary living ecology.⁷

Keywords: Life, Ontology, Holonomics, Meta-Systems, Special Systems

INTRODUCTION

The distinction between “Life” as a phenomenon and our experience of it as “Living” beings needs to be approached in terms of a “Neg-entropic Living Social Hermeneutical Phenomenology⁸” in order to be properly understood. This is because the same kind of relation between ourselves and life exists as the relation between ourselves and the social. In other words, we are already living as we are already social beings. Both Sociality and Life are already always lost origins of the individuals that come to question the distinctions between the individual and the society or between the living and the dead. Social Phenomenology⁹ is an approach which takes the social as primary, just as it takes

⁵ O'Malley, John B. *Sociology of Meaning* London, Human Context Books. 1972

⁶ Sandywell, Barry. *Logological Investigations* London ; New York : Routledge, 1996. v. 1 to 3.

⁷ See also the following papers presented at ISSS2000: *New General Schemas Theory: Systems, Holons, Meta-Systems & Worlds in the Research Toward a General Theory of Systems* SIG; and *Intertwining Of Duality And Nonduality in the Duality Theory* SIG.

⁸ We say hermeneutical phenomenology here because as Heidegger shows in *Being & Time* this Neg-entropic Living Social Phenomenology needs to be augmented by a hermeneutics that looks beyond the immediately given in order to produce understanding which always must go beyond what the information given to represent real understanding.

⁹ Which is short for Neg-entropic Living Social Hermeneutical Phenomenology.

the Living as primary. In other words, it does not comprehend a view that would separate us from either the living or the social. Instead, it views both of these phenomena and our embeddedness in them as the milieu out of which we separate ourselves as scientific observers which is a further differentiation of our individuality from society. Similarly, we are living already, and it is a social project to build dead and impersonal institutions and disciplines which reify that fundament of our living experience within the social milieu. However, it should occur to us to ask ourselves. What is the nature of this primal milieu¹⁰ which is inseparably social and living for us? We notice that it is carried on in an environment that is far from the equilibrium dynamic environment of the type that Prigogine calls a dissipative ordering structure that is negatively entropic. All we have to do is look around the earth at the variety of species that abound to see that we live in a thin film of highly neg-entropic matter on a small planet of an ordinary star which is one out of an uncountable number of stars in one galaxy out of myriads. Thus, a complete view of this primal situation would note that it is a differentiation of matter in environments far from equilibrium circumstances that gives rise to life which is inherently social. We discover ourselves already part of this situation and differentiate ourselves from the rest of the physical world, from the rest of the living world, and from the rest of the social world of our species.

Social Phenomenology considers the primary situation of negatively entropic living social being as central to all our concerns and that everything we know and do differentiates ourselves out of that primary situation which, to us, seems to be one of the biggest mysteries of all. Social Phenomenology turns the world upside down and places the “negatively entropic living social” primary situation¹¹ of our life at the core of our understanding of the world rather than relegating it to a marginal note. Husserl in his Krisis¹² showed that we must look at phenomenology first because it is through phenomenology that everything else becomes available for us to study and understand. Science produces a spiritual crisis by separating itself from the lifeworld and reifying things and concepts including ourselves. But even Husserl's individualistic phenomenology must give rise to social phenomenology because it recognizes that the social must come before all our experiences as individuals¹³. It is difficult for us to understand the world from the point of view of social phenomenology due to the individualism that is imprinted upon us within our Western culture. We distrust immersion in the social and deprecate the mob which appears when our reified social institutions break down. Precisely the same problem appears in the distinction between the living and life. The life of others is the objective phenomenon, whereas the living

¹⁰ Henry Corbin in Mundus imaginalis: or, The imaginary and the imaginal. Ipswich : Golgonooza Press, 1976. This is the Imaginal Realm which Fred Alan Wolf in his book Dreaming Universe posits as having a quantum mechanical nature which unites observer with the observed. See Wolf, Fred Alan The Dreaming Universe : a mind-expanding journey into the realm where psyche and physics meet New York : Simon & Schuster, c1994.

¹¹ which is by the way intrinsically non-rational and imaginal

¹² Husserl, Edmund, The crisis of European sciences and transcendental phenomenology an introduction to phenomenological philosophy. Translated, with an introd., by David Carr. Evanston, Northwestern University Press, 1970.

¹³ Sadler, William Alan. Existence & Love: a new approach in existential phenomenology, New York, Scribner 1969.

experience is our own. And the key point is that without social upbringing, we could not achieve the capacity to even make the distinction. A similar problem exists with understanding the negatively entropic circumstances that make life possible. We have a difficult time thinking of living things as merely matter. Bergson¹⁴ had to posit an *élan vital* which separated the living from the dead things, and even today this dualism is alive and well in our consideration of our self-imposed separation from nature.

It is necessary to embrace a new way of thinking in which the old dualisms are put out of play and a new understanding is grasped that satisfies our longing for an understanding of ourselves within nature, as living creatures, and as social creatures. We want this comprehension of ourselves and our place in nature to unify all these concepts that have been nihilistically separated out into various disciplines within academia, i.e. thermodynamics, biology and sociology. We want to understand how all the other disciplines unfold from this primary situation of our embodiment in our own social lifeworld which connects to nature. This is the fundamental problematic of social phenomenology.

ONTOLOGICAL LEVELS OF LIFE/LIVING

The view we take in order to facilitate this understanding is one of developing a non-dual approach to the understanding of each of these concepts in relation to the dualities that are normally projected by Western science as it goes about the business of attempting to understand the world based on its inherently dualistic approach. Dualism does not only mean production of opposites, but indicates the production of extreme nihilistic opposites which struggle until one overcomes the other. However, these nihilistic extreme opposites ultimately prove to be the same thing and thus the nihilistic distinction is ultimately no distinction at all¹⁵. As Fred Alan Wolf intimates: nihilism is always the given answer to the wrong question. In other words, nihilism always leads us through a maze of blind alleys although the labyrinth is a non-nihilistic because it has a single path that leads to its center with no blind alleys. The classic example of a nihilistic distinction is mind and body which, in our predominantly idealistic tradition, exalts the mind over the body. This is mirrored by many other similar dualities like the exaltation of the paternalistic male over the subjugated female, the white race over the black race, colonizer over the colonized¹⁶, etc. Dualities are applied analytically to dissect the world and the phenomena that it presents. A non-dualistic approach is at the same time non-nihilistic. A non-dualistic¹⁷ approach attempts to hold the dualisms apart and explore the middle ground between them. It rejects Aristotle's principle of excluded middle. As such, it attempts to find the point where things distinguish themselves naturally rather than imposing upon them distinctions that are inappropriate projections.

¹⁴ Bergson, Henri, Matter and Memory. Translated by Nancy Margaret Paul and W. Scott Palmer, London, G. Allen & Unwin; New York, Macmillan, 1950.

¹⁵ Rosen, Stanley. Nihilism a philosophical essay. New Haven, Yale University Press, 1969.

¹⁶ Memmi, Albert. The Colonizer and the Colonized. Translated by Howard Greenfeld. Boston : Beacon Press, 1967.

¹⁷ Loy, David. Nonduality : a study in comparative philosophy. New Haven : Yale University Press, c1988.

When we apply this to the distinction between *life* as an objective phenomenon and *living* as a subjective phenomenon, we immediately realize that what is behind this distinction is the dualistic relation between subject and object. "Life in itself" is a single phenomenon seen from these two nihilistic and dualistic viewpoints. Life as an objectively reified and scientifically studied phenomenon is seen as distinct from the subjective view of life within our experience. Heidegger, already in Being and Time¹⁸, subverted this view of the subjective versus the objective by attempting to look deeper into what came before the arising of the subject and object dualities. He described this prior existent as Dasein (being there) which is prior to the arising of subject and object distinction and thus their dualism. Dasein is the ecstatic pouring out of Being into Being by the unique process of being-in-the-world which thereby produces a world. This ecstasy is a dynamic process that underlies all static dualistic distinctions within our tradition. Dasein is *life itself in the living* prior to the distinction between subjective experience and objective knowledge of that phenomenon. In Dasein, we are too caught up in the ecstasy to make this separation. Dasein is "living life" by expressing this non-dual possibility that hides within the excluded middle between subject and object.

In general, Heidegger calls this difference the two modalities of being-in-the-world which are present-at-hand (Pure Being) and ready-to-hand (Process Being). Dasein is rooted in Process Being which is Heraclitian and probabilistic. The subject/object dichotomies persist in Parmenidian Pure Being which is a reification of the world as objective and as separated from subjective experience. In Pure Being, there is a distinction between *life* as objective phenomenon and *living* as an experience; but this collapses at the level of Process Being where Dasein is "living life" and cannot separate itself to become either an objective disembodied observer or into a purely subjective experience.

However, the realization of Dasein is not the end of the story because Dasein is primarily MitSein, "With-there" or "Withness" in its social milieu which is what appears before Dasein differentiates itself. Other philosophers following Heidegger such as Merleau-Ponty and Levinas have explored this territory in which Dasein collapses into what I call the Query. The Query is the one who asks: What is "living life?" Levinas points out that at this level of Being, ethics and meta-physics collapse together because the individual becomes absorbed back into the "social," or the social upbringing that makes possible the arising of language within the organism. It is clear from observing wolf children that without the social involvement with the mother and family, we would never achieve this capacity. Merleau-Ponty talks about how philosophy must take into account the genetic and developmental unfolding of the child and its development of language in attempting to understand the individual who projects a world. First, there is the social world, then individuals form subsets of that world through the ecstasy of the projection of their own lifeworld. Derrida calls this level of Being difference, which he says has the nature of differing and deferring. At this level, our life and our social world and our natural world and the relations between them become entangled. Derrida describes an indecision which exists in the pause between the words "living life" that Dasein is lost within. We represent this pause as the space between the words or the point of indecision between

¹⁸ Heidegger, Martin, Being and Time Translated by John MacQuarrie and Edward Robinson. London, SCM Press, c1962.

the two, which is the internal and external. Derrida describes it as a hinge¹⁹. Levinas describes it in terms of mutual bearing. Life bears the living and the living bears life just as the socializing mother bears the child while the child must bear the ministrations of the mother. There is a hiatus in between the child and the mother which is both “neither” and “both,” in which both are lost. We come to ask, who “lives life?” This is the query which gets hung up on the hinge or lacuna²⁰ between defining “living” and “life” as separable terms. When we collapse into the Query, then an endless series of possibilities unfold between which we cannot decide. This undecideability is like the quantum uncertainty, only on a macro level. It makes us consider the possibility that macro quantum mechanics is a reality which contravenes the Copenhagen convention²¹. We see it also in the arguments concerning the contents of consciousness brought up by David Chalmers in The Conscious Mind²². There is a postulate that different individuals may experience the qualia differently and so thereby splintering the world of subjectivity just like the world of objectivity is splintered by the non-determinacy of quantum mechanical states. There is a separation between the objective world without qualia differentiation on the one hand and the subjective world of qualia differentiation on the other hand. Subjective differentiation of the qualia causes an explosion of qualitatively different worlds for different subjects. On the other hand, there is the non-determinacy of quantum mechanics which under the interpretation of David Deutsch in The Fabric of Reality²³ produces multiple real simultaneous universes. Quantum phenomena is seen as the interference between these real universes. Note how on the side of consciousness there is a splintering of subjective worlds, and on the side of objective nature there is a splintering of objective worlds. If instead, we do not accept the distinction between subject and object, and the distinction between micro nature and macro nature posited in Copenhagen, then we find ourselves in a world where there is macro quantum mechanical phenomena which is qualitative in nature. Viewing this strange imaginal world²⁴ in which macro quantum mechanical phenomena are not suppressed, where neither quality is given precedence over quantity, nor quantity is given precedence over quality, is a way of viewing the world as seen by the Query, i.e. the world of Difference prior to Dasein. In Dasein, the ecstasy of existence is separable from the reification of things in the world. The Query is in the hiatus or lacuna between the ecstasy and its reification. In that world there are two splinterings that overlap. There is the splintering of the subjective qualia producing myriad subjective worlds, and there is the quantum mechanical splintering which produces multiple real worlds. This splintering has the nature of differing and deferring or Difference. We call this kind of being: Hyper Being after the Hyperdialectic of

¹⁹ Derrida, Jacques. Of Grammatology, translated by Gayatri Chakravorty. Baltimore : Johns Hopkins University Press, 1976.

²⁰ Lacan calls this lacuna the "Sign of the Father." See Lacan, Jacques, Selections Écrits : a selection; translated from the French by Alan Sheridan. New York : Norton, c1977.

²¹ Fred Alan Wolf in Dreaming Universe provides us with the first cogent theory of how this macro-quantum mechanics may be experienced through our dreams and the dreams of everything in the universes.

²² Chalmers, David John, The Conscious Mind : in search of a fundamental theory. New York : Oxford Press, 1996.

²³ Deutsch, David, The Fabric of Reality : the science of parallel universes- and its implications, David Deutsch. New York : Allen Lane, c1997.

²⁴ We may trace this back to Democritus, the father of atomic theory, who researched the eidolons emitted from all bodies. Lindsay, Jack, The Origins of Alchemy in Graeco-Roman Egypt. New York, Barnes & Noble, 1970. Page 95.

Merleau-Ponty that he describes in The Visible and the Invisible²⁵. That is the hyperdialectic between the Process Being of Heidegger and the Nothingness of Sartre. There he distinguishes this hyperdialectical mode as being -in-the-world, which I call in-hand, from another deeper modality, which I call the out-of-hand of Wild Being.

Think about “living life” in terms of the hinge (or lacuna or hiatus) of Difference. We do not know whether we are in separate realms of qualia or within separate physical universes. We experience macro quantum mechanical states qualitatively as the imaginal realm, and in that way our consciousness becomes completely intertwined with the physical and subjective worlds in a way that cannot be unentangled. This hinge within the “living-hinge-life” dichotomy is the same as the individual -hinge-social or the thermodynamics-hinge-physics dichotomies. In other words, the trace of the hinge pulses in the midst of many of our dichotomies. The hinge itself is merely an indecision between our projected categories. Cornelius Castoriadis calls the Magma the substrate on which we project our categories. We have strange attractors within our category schemes that cause us to hover over the distinctions we make between living and life. Because we project these categories on ourselves and everything else in some sense, we are beyond the categories themselves in a realm that we only see when we are unable to decide whether we are the life or the living, the individual or the social, the thermodynamically far from equilibrium entropic or the physical. At the level of Hyper Being, the concept of life is equivalent to the third meta-level of the concept, i.e. “the lively living of life?”

The Hyper Being of the Query is not the end of the story. The Query itself slides into another even deeper strata of Being. That strata is called the Enigma, which finds no answer to the Query: Who is Dasein? or Is Dasein Life or Living? or Is Dasein individual or social? or Is Dasein thermodynamical or physical? It is Merleau-Ponty that discovers this level of Being in The Visible and the Invisible. He calls it Wild Being and contrasts it with Hyper Being. The Enigma is what allows us to see ourselves at the hinge of indecidability. The enigma is a position that we cannot step back into to view ourselves any more deeply. Life is an enigma because we are that enigma. The social is an enigma because we are that enigma. The neg-entropic far from equilibria thermodynamic system is an enigma because we are an enigma. First, we are the enigma, then all the other distinctions appear as facets of that enigma. It is the enigma that is the object of social phenomenology par excellence because it is opaquely social, living, thermodynamical and more beyond that which is beyond our kenning. However, this level of Wild Being has of late been the subject of much philosophy building. Deleuze and Guattari in Anti-Oedipus²⁶ and Thousand Plateaus²⁷ build a philosophy at this level which they call the Rhizome. John S. Hans in the Play of the World²⁸ does the same. Arkady Plotnitsky in

²⁵ Merleau-Ponty, Maurice, The Visible and the Invisible followed by working notes. Edited by Claude Lefort. Translated by Alphonso Lingis. Evanston [Ill.] Northwestern University Press, 1968.

²⁶ Deleuze, Gilles. Anti-Oedipus : capitalism and schizophrenia. Translated from the French by Robert Hurley, Mark Seem, and Helen R. Lane. New York : Viking Press, 1977.

²⁷ Deleuze, Gilles. A Thousand Plateaus : capitalism and schizophrenia Translation and foreword by Brian Massumi. Minneapolis : University of Minnesota Press, c1987.

²⁸ Hans, James S., The Play of the World. Amherst : University of Massachusetts Press, 1981.

his book Complementarity²⁹ gives us a good view of the relation between Bohr, Bataille and Derrida with respect to this level of Being. Also, Cornelius Castoriadis³⁰ builds a dynamic theory of social institutions at this level where he distinguishes the Magma upon which all distinctions are projected. Thus, from a philosophical viewpoint, there are so many outposts on this frontier of Wild Being. Wild Being is only an aesthetic surface and has no depth itself, so it is very difficult to think at this level of Being. But here we see, as Merleau-Ponty tells us, the chiasm between living-life and life-living. The reversal of this pair of terms has a subtly different meaning. Merleau-Ponty says that this chiasm or reversibility has the nature of touch-touching, i.e. you cannot feel from both sides at the same time. Thus, there is an interspace within the reversed dichotomy that is subtle but real. That chiasmic non-dual interference between the reversible images has the nature of Flesh according to Merleau-Ponty. Deleuze and Guattari call it the Rhizome. Cornelius Castoriadis calls it the Magma. John S. Hans calls it Play in the sense of the play between things, i.e. the allowable movement that shows us differences. Arkady Plotnitsky calls it Complementarity as defined by Bohr where there is no deep structure underlying the complementarity but merely the complementarity itself. The propensities are etched in the intaglio of the two phases of reversibility within the spacetime interval, and these propensities send us chaotically into one dualistic basin of attraction or another.

In this way, we see that life will always be an enigma because it is rooted in Wild Being, i.e. the deepest level of Being in which all the dichotomies underlying dualisms resolve into the chiasm or reversibility between the opposites differences with themselves in conjunction. There is no deeper level of Being. At the fifth meta-level of Being, we reach the unthinkable which is interpreted as Existence. Beyond Wild Being the difference between life and living, individual and social, thermodynamical and physical becomes unthinkable. This unthinkability gives us an intimation of the groundlessness of Being. The culmination of Being occurs when the operator and the operand are the same. "Life autopoietically Lives" is a view of the monolith of Being. We can express it as the "Social reflexively Socializes" or the "Thermodynamical neg-entropically Thermodynamicizes." This monolith of Being encompasses the verb and the noun in a single construct. But we notice that there is the difference between the noun and the verb. That difference leads us to understand Hyper Being or Differ ance. But ultimately the distinction between the two breaks down and we are thrown into the chaotic Wild Being where there is mixture between the life and living, social and the socialized, thermodynamical and the thermodynamicized, order and disorder, continuity and discontinuity. At the level of Wild Being, the concept of life is equivalent to the fourth meta-level of the concept, i.e. "a lively living of life as lived."

The fifth meta-level of Being is utterly non-dual and non-nihilistic. It is what we call supra-rational. In that utter nonduality where even reversibility does not exist, the tension between living and life is finally resolved in silence or death. But that resolution occurs in

²⁹ Plotnitsky, Arkady. Complementarity: anti-epistemology after Bohr and Derrida. Durham : Duke University Press, 1994.

³⁰ Castoriadis, Cornelius. The Imaginary Institution of Society. Translated by Kathleen Blamey. Cambridge, Mass. : MIT Press, 1987.

a very strange way. It is impossible to think of the augmentation of “a lively living of life as lived” with another way of saying “life” that takes us to a higher level of expression. Somehow the mind freezes up when it tries to go to that fifth meta-level of Being.

HOLONOMIC LEVELS THAT DEFINE LIFE/LIVING

When we reach the level of utter nonduality in our consideration of these primary dichotomies such as life living, social socializing, thermodynamic thermodynamicizing, etc., then we must go to special systems theory in order to understand the situation as it has unfolded in Existence beyond Being. General Systems Theory concerns social gestalts, i.e. what the socializing social, living life, thermodynamicizing thermodynamic, i.e. negentropic system sees. Social phenomenology studies the phenomenon that “we are ourselves.” The dual of General Systems Theory must be a general Meta-systems Theory concerning the milieu of the system under our gaze. Meta-systems are environments, ecosystems, situations, contexts, etc. of systemic gestalts. Systems as gestalts are wholes greater than the sum of their parts. Meta-systems, on the other hand, are wholes less than the sum of their parts. Meta-systems are full of niches tailor made for the systems that appear within it and interact within it. A Meta-system is the origin and arena of the systems that comprise it. But it is like an operating system for those systems giving them resources and the processing time they need to exist. Our culture and sciences are blind to meta-systems. We see systems but not their dual, which is the meta-system. Even ecology, which is our only explicitly meta-systemic science, is bound by the ideas of systems instead of understanding the nature of the meta-systems which underlie the environment being studied³¹. The meta-system is a General Economy as described by Bataille in the Accursed Share³² which he contrasts with the Restricted Economy of the system³³.

Once we realize the duality between the system and the meta-system as wholes either greater or less than the sum of the parts, then it is necessary to realize that there are systems which are wholes exactly equal to the sum of their parts, like the perfect numbers studied by Euclid. These are special and anomalous systems, and we discover they are three in number. There are several different kinds of balance of “part to whole.” They roughly correspond structurally to perfect, amicable and sociable numbers. These kinds of balance are called Dissipative after the concept of the Dissipative ordering structures of Prigogine, Autopoietic after the theory of Maturana and Varela, and Reflexive after the social theory of John O'Malley and Barry Sandywell. These three kinds of systems and their relation to the Emergent Meta-system are explained in detail by the author in his paper *Reflexive Autopoietic Dissipative Special Systems Theory*³⁴. This theory shows how the utterly non-dual level of existence is articulated. Existence beyond Being is not without structure but has a very special structure that demands that we augment our

³¹ See S.T.A. Pickell, J. Kolasa, G.G. Jones, Ecological Understanding. Academic Press 1994.

³² Bataille, Georges, The Accursed Share : an essay on general. Translated by Robert Hurley. New York : Zone Books, 1988-1991.

³³ Plotnitsky, Arkady. Complementarity : anti-epistemology after Bohr and Derrida. Durham : Duke University Press, 1994.

³⁴ See <http://server.snni.com:80/~palmer/autopoiesis.html> or <http://dialog.net:85/homepage/>

General Systems Theory by the addition of other related disciplines. We must construct the inverse categorical³⁵ dual of the System to produce the Meta -system. Then we must realize that in the region between these categorical dualities there exists Special Systems that defy our intuitions, but have a definite mathematical form and specific phenomena that shows that they have actual existence, not just theoretical possibility. Beyond that there is the Emergent Meta -systems theory that combines the special systems together with the normal systems theory to give us a dynamic image of the Meta-system.

We learn from these extensions that in the process of the social gestalt unfolding out of the Meta-system of the social, there is a series of stages, first of which is the social field, which Deleuze and Guattari call the Socius. It is reflexive. Barry Sandywell described this in his Logological Investigations. The next stage is the living autopoietic system which unfolds from the social as a further holonomic differentiation of the social field. Finally, the dissipative structures which produce neg -entropy unfold from the autopoietic system as yet a further differentiation. Finally the social gestalt appears within the meta -system of the social environment. Each of these stages are partial systems and partial meta-systems. They are, in fact, what Koestler calls "Holons" because they are Janus faced looking up the hierarchy of the meta -system and down the hierarchy of the system at the same time. In this emergent unfolding and differentiation, the social environment of the various species comes first, then comes the social field of our species, then comes the differentiation of individual organisms which then differentiate into smaller structures called dissipative systems and which Deleuze and Guattari call desiring machines. It is on the basis of the entire structure of emergent differentiation that the social gestalt finally appears as the socially constructed object held in view as a system. The whole greater than the sum of the parts unfolds from the whole less than the sum of the parts through a series of stages in which the whole is exactly equal to the sum of the parts. It turns out that the difference between these five stages is, in fact, the four different kinds of Being. Thus, there is a structure to the following construction that underlies the differentiation of phenomena.

<u>Kinds of Being</u>	<u>Emergent Systemic Levels</u>
	System = thermodynamic-living-social gestalt
Pure Being	
	Holonic Dissipative Special System = Thermodynamic
Process Being	
	Holonic Autopoietic Special System = Living
Hyper Being	
	Holonic Reflexive Special System = Social
Wild Being	
	Meta-system

Thus, the non -dual is interlaced with and embedded in the dual. It is not without structure, but merely has a kind of structure that we are not used to seeing due to the dualistic bias of our culture. In the non -dual, we see the thermodynamic, living and social

³⁵ In the sense of mathematical category theory.

distinguished by the emergent levels as they exist in the unfolding between the meta-system and the system. We find that these non-dualities appear in the interstices between the levels of Being that we considered earlier. In other words, the differences between the thermodynamic, living, and social, differentiate the various stages of consideration of the nature of each of them. The subject of our inquiry, when we consider the imaginal primal situation encountered by a living social phenomenology, structures our means of inquiring. We might expect this since we ourselves are the subject of our inquiry and thus we are structuring ourselves. In other words, if we consider the universe, including ourselves, to be dreaming the quantum mechanical probability wave with its incomprehensible superimpositions which we experience qualitatively as the imaginal realm, then that dreamtime which we called the primary or archaic situation has a peculiar structure which embodies the balance of nonduality and at the same time defines the unfolding of the imbalance of the dual through the meta-levels of Being.

CONCLUSION

This is a taste of the kinds of insight afforded us by an Ontological and Holonomic view of the difference between Life and Living. We find that life/living means something different at each level of Being. But eventually as we go beyond Being into Existence, we find our own life/living, along with our social and thermodynamic basis, structures the kinds of Being just as our inner nature structures our understanding of ourselves at the deepest level. What seems a mystery in terms of the hierarchy of Being, becomes very clear in terms of the holonomic hierarchy between the systems and the meta-system, we define our own mystery very succinctly.

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³⁶ <http://server.snni.com:80/~palmer/disab.html> You may also try <http://dialog.net:85/homepage/> or <http://think.net/homepage/> for any of the web related material.

³⁷ <http://server.snni.com:80/~palmer/fbpath.htm>

³⁸ <http://server.snni.com:80/~palmer/resume.html>

Systems Engineering Process improvement based on EIA 731 and CMMI. He has presented a tutorial on “Advanced Process Architectures³⁹” which concerned engineering wide process improvement including both software and systems engineering. Besides process experience, he has recently been a software team lead on a Satellite Payload project and a systems engineer on a Satellite Ground System project. He has also engaged in independent research in Systems Theory which has resulted in a book of working papers called Reflexive Autopoietic Systems Theory⁴⁰. A new introduction to this work now exists called Reflexive Autopoietic Dissipative Special Systems Theory⁴¹. He has given a tutorial⁴² on “Meta-systems Engineering” to the INCOSE Principles working group. He has written a series on Software Engineering Foundations which are contained in the book Wild Software Meta -systems⁴³. He now teaches a course in “Software Requirements and Design Methodologies” at the University California Irvine Extension. He may be reached at palmer@think.net.

³⁹ <http://server.snni.com:80/~palmer/advanced.htm>

⁴⁰ <http://server.snni.com:80/~palmer/refauto2.htm>

⁴¹ <http://server.snni.com:80/~palmer/autopoiesis.html>

⁴² <http://dialog.net:85/homepage/incosewg/index.htm>

⁴³ <http://server.snni.com:80/~palmer/wsms.htm>

SIG: Research Toward a General Theory of Systems

ABSTRACT

PALMER, K. D.

NEW GENERAL SCHEMAS THEORY: SYSTEMS, HOLONS, META-SYSTEMS & WORLDS

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The theory of Special Systems and the Emergent Meta -systems stands as a new extension of General Systems Theory. Briefly, Systems are defined as Gestalts that are wholes greater than the sum of their parts. Meta -systems are defined as environments which are wholes less than the sum of their parts. Special Systems Theory posits that there are a class of special systems that are exactly equal to the sum of their parts which has not been recognized before. Koestler called these special kinds of systems HOLONS, and we call the investigation of these specially balanced systems HOLONOMICS. We posit that there are exactly three special systems which are called Dissipative neg -entropically ordering (Prigogine), Autopoietic (Maturana and Varela) and Reflexive (O'Malley and Sandywell) which are mathematically based on Hyper Complex Algebras. The identification of these special systems that combine together to form an image of the environment called the Emergent Meta -system is an important development in General Systems Theory that has implications for the future development of General Systems Theory. In general, it means that there are really three kinds of theory that need to be pursued in parallel. There is General Systems Theory which needs to be augmented by a General Meta -Systems Theory which is a theory of environments, ecosystems and all other "general economies" as opposed to "restricted economies" (cf. Bataille Accursed Share). Then there is the theory of Special Systems or Holonomics which studies the rare and anomalous balanced systems where the whole is exactly the sum of its parts neither more (as in the case of systems) nor less (as is the case with meta -systems). The study of these ways of looking at things in the world is posed in terms of what is called General Schemas Theory which includes other schemas as well, for example the schema of the World which serves as a context for understanding Systems, Holons and Meta-systems. (Research Toward a General Theory of Systems. Special Integration Group.)

NEW GENERAL SCHEMAS THEORY: SYSTEMS, HOLONS, META-SYSTEMS & WORLDS

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SUMMARY

The theory of Special Systems and the Emergent Meta -systems stands as a new extension of General Systems Theory. Briefly, Systems are defined as social gestalts that are wholes greater than the sum of their parts. Meta -systems are defined as environments which are wholes less than the sum of their parts. Special Systems Theory posits that there are a class of special systems that are exactly equal to the sum of their parts which has not been recognized before. Koestler called these special kinds of systems HOLONS, and we call the investigation of these specially balanced systems HOLONOMICS. We posit that there are exactly three special systems which are called Dissipative negative entropic ordering (Prigogine), Autopoietic (Maturana and Varela) and Reflexive (O'Malley and Sandywell) which are mathematically based on Hyper Complex Algebras. The identification of these special systems that combine together to form an image of the environment called the Emergent Meta -system is an important development in General Systems Theory that has implications for the future development of General Systems Theory. In general, it means that there are really three kinds of theory that need to be pursued in parallel. There is General Systems Theory which needs to be augmented by a General Meta -Systems Theory which is a theory of environments, ecosystems and all other general economies as opposed to restricted economies (cf Bataille Accursed Share). Then there is the theory of Special Systems or Holonomics which studies the rare and anomalous balanced systems where the whole is exactly the sum of its parts neither more (as in the case of systems) nor less (as is the case with meta -systems). Meta-systems must be distinguished from SuperSystems which are the nesting of systems at various levels of abstraction. Meta -systems are deconstructed SuperSystems. Meta -systems tend to be invisible because they are the background on which the System gestalt is seen, i.e. they are a deeper background than the background of the figure in the gestalt. The study of these ways of looking at things in the world is posed in terms of what is called General Schemas Theory which includes other schemas as well, for example the schema of the World which serves as a context for understanding Systems, Holons and Meta-systems.

In other words, we need to be concerned with a wider theoretical framework than merely General Systems Theory. When we look at that wider framework, then we see that some interesting and anomalous systemic features arise that can only be seen when we compare Systems to Meta -systems. However, this broader framework is just as general as General Systems Theory yielding General Meta -systems Theory and General Special Systems Theory that both apply to many disciplines. But the important point is that the discovery of these new levels of generality force us to reconsider some of the basic assumptions of

our dominant Western Philosophy of Science in such a way that makes comprehensible earlier traditional sciences and also helps us understand how a kind of science that is not alienated from the Earth may be built from the ground up on different assumptions.

How the objectives of Research Toward a General Theory of Systems Special Integration Group are met:

Objective 1. To discover or develop a set of universal concepts and algorithms that are relevant among all the branches of science, and useful in describing all the diverse systems in nature and culture. -- Examples are: Aristotle or chaos theory.

Special Systems Theory and Emergent Meta-Systems Theory are founded on the mathematics of Hyper Complex Algebra and Non-orientable Surfaces in Topology that gives it a mathematical rigor to be envied by other systems theories. It is interesting that these kinds of Algebra which have been known from about 1850 have not found much use within physics or other sciences. It is precisely these forms of mathematics that describe the relation between elements within the special systems and within the Emergent Meta-system.

Objective 2. To give a rigorous definition to these notions in the physical sciences to start with; to add conceptual expansions to concepts and algorithms where necessary or appropriate in order to cover the emerging properties of more complex systems; to apply these expanded concepts systematically in the varieties of complex sciences such as cybernetics, biology, sociology and ecology.

The hierarchy from System through the Special Systems to the Meta-system is a series of emergent stages, each with its particular properties that arise on the basis of the lower levels but contributes specific emergent new properties at each level. In the case of this systems theory, these new properties are described as the properties lost when we move from one algebra to another. Because these properties and the subsequent systems that occur when the properties are lost are mathematically defined, they are very rigorous. The algebraic model gives you a combination of additiveness and emergence together which is characteristic of holonomic systems in general.

Objective 3. To test the validity of the unified scientific theories; to demonstrate and to verify their predictive power by practical examples in each of the branches of science; to otherwise establish criteria under which the behaviors of observed and inferred systems can be reasonably evaluated.

Besides the mathematical definition of the various special systems and the Emergent Meta-system, there are also a series of physical examples of these rare and anomalous systems that occur in nature which have the same structural configuration predicted by the mathematical model. Special Systems are always anomalous and rare, but the

physical examples show that they do indeed exist in the realm of physics, and they probably also exist in other disciplines as well as yet unrecognized⁴⁴.

Keywords Life Ontology, Holonomics, Holon, Meta-System, Special System, World

GENERAL SCHEMAS THEORY

Instead of talking about General Systems Theory as the rubric under which we might subsume other sister disciplines, let us talk about a General Schemas Theory which subsumes all the various ways we understand the myriad phenomena studied by different disciplines. In this paper, we will consider several other potential sister disciplines to General Systems Theory and their interrelations. The first of these is the General Theory of Meta -systems which is still nascent. By meta -systems here is meant ecosystems, environments, ecologies, contexts or milieus of Systems. The second of these is the General Theory of Holons which was inaugurated by Koestler in his book Janus⁴⁵. A holon is something which is both a part and a whole at the same time. Here we will consider a variant of General Meta -systems Theory which sees Meta -systems as composed of Holons and Systems which will be called Emergent Meta -systems Theory. It is called “Emergent” because in it we study how Meta -systems arise as a schema with its own characteristics out of the combination of holons and systems. The three General Theoretical disciplines concerning these schemas: systems, holons and meta-systems form an unexpected and fascinating combination that has unprecedented explanatory power. Together they open up a new horizon of research by supplying a new way of looking at phenomena which may be applied to various disciplines. A theory is a conceptual view of phenomena. We are seeking general views that may be applied across disciplines, i.e. General Theories, giving unity to the enterprise of science. Our views of phenomena may be reduced to schemas such as System, Form, and Pattern which, along with others, give a basis for understanding phenomena by providing a template, or a set of analogies, which illuminate the relation between the various aspects of the phenomena under study. Here we propose two other schemas which, like that of the “system,” are slowly gaining favor among scientists as ways of looking at things. What will be explored in this paper is the interrelations that are emerging from the study of the relations between the schemas themselves. The cutting edge of scientific theory development is the exploration of how we might combine various schemas or foundational theoretical views into composites that offer the possibility of applying these various views in concert to better understand the phenomena under study. The most successful of these which is the basis of most Western scientific theorizing is the combination of the Formal Structural Systems which is exemplified by the work of George Klir⁴⁶ that combines the schemas of Form, Pattern and System into a single theoretical edifice. In this essay we will construct and explore another interesting

⁴⁴ A paper on this new extension to General Systems Theory called Reflexive Autopoietic Dissipative Special Systems Theory exists at <http://server.snni.com:80/~palmer/autopoiesis.html> See also the following papers presented at ISSS2000: Defining Life And The Living Ontologically And Holonomically in the What is Life and Living? SIG; and Intertwining Of Duality And Nonduality in the Duality Theory SIG. References are given in the first paper where the reference is mentioned.

⁴⁵ Koestler, Arthur. Janus : a summing up. New York : Random House, c1978.

⁴⁶ Klir, George J., Architecture of Systems Problem Solving New York : Plenum Press, c1985.

combination of schemas, i.e. system, holon and meta-system, which gives us an unprecedented and powerful explanatory perspective on phenomena that has baffled Western science since its inception. Many times it is the limitations of our conceptual tools which causes us to misrepresent and misunderstand phenomena. When we take the chance on a new paradigm, sometimes we are rewarded with new insights that could not be apprehended through the old paradigm. One way to understand paradigms is in terms of combinations of schemas of understandings and fundamental assumptions that underlie our theorizing in a specific discipline. What is offered here is a new combination of conceptual schemas which might be combined with theoretical assumptions to produce new paradigms for specific disciplines. Because our focus is on General Schemas Theory and not on particular disciplines, the assumptions that would be necessary to produce a paradigm for a field of study will not be generated. Rather, we will concentrate on the interrelation between these various schemas and what we might learn from them that might be fruitfully applied at a more specific level of theorizing in a particular field to give cogent results.

THE SYSTEM SCHEMA: Gestalts and Flow Duality

We will characterize the “system” schema here in terms of a social gestalt. In other words, we will not enter into the debate as to whether systems are “out there” in the world, but instead will say that a system is something projected by a social group as a social construction or invention. This obviates the problem of whether we are imposing or discovering system schemas in relation to phenomena. The system schema gets its objective nature from the fact that it is a “social” construction or invention which is projected in concert by a group of people. This is a matter of perceptual pre-synthesis on the part of the group and can be studied by a social phenomenology⁴⁷ which is attuned to looking at the social gestalts produced by various groups including scientists.

What the social gestalt gives us is a basis for thinking about the system which sees it as a projected schema and not as something necessarily inherent in existence. The projection of this schema in a way that cuts through the joints of phenomena as Plato has advised us is a skill to be developed and which has been perfected over the centuries by science. At one time, all of science was concentrated on Forms which derived from geometry and algebra and their combination discovered by Descartes. It has taken a long time to establish that Systems are different from Forms and just as useful in their own right as ways of comprehending relations among Forms. Forms are the Figures that appear on the backgrounds of the systemic gestalts. We talk about systems as sets of entities and their static or dynamic interrelations. We see those entities as figures on the background of all the other entities within the system. We bring out each entity one at a time to stand out on that background, and the entire system is the set of all possible foregrounding of entities on the background of the possible focal entities within a system. It takes time to go through and enumerate the entities in a system. It takes time to bring these figures into juxtaposition in order to understand their separate interrelations which, woven together,

⁴⁷ As mentioned in "Defining Life and Living Ontologically and Holonomically" by "Social Phenomenology" we really mean "Negentropic Living Social Hermeneutical Phenomenology" which we have called the "Primary or Archaic Situation".

make up the web of systemic relationships. Thus, we may view a system synchronically as all the entities and their relations at one point in time, or diachronically as the evolution of the system as the entities change and their interrelations transform over time.

We must first realize that a system is really a social gestalt. That is a series of entity figures on the background of the entire system within a specified boundary. And we realize that their interrelations as projected by some social group so that any one individual's perceptual or conceptual gestalt of the object is a reduction to a single perspective projection of the group's multiple perspective projection. [We must recognize, along with Husserl⁴⁸ and Gurwitsch⁴⁹, that gestalt is always both perceptual (Husserl's noema) and conceptual (Husserl's noesis) but may emphasize one or the other in any particular instance.] Then we may ask ourselves what is the dual of the Gestalt way of looking at things. After years of missing this essential point, I realized that the dual of the gestalt schema is the flow schema. In a gestalt there is a figure on a background. If we take the figure and submerge it so that the background becomes the foreground, then it becomes a reference point on the basis of which we can get some idea of the flow of the foreground. A rock which sticks up from a stream is a gestalt figure to us on the background of the flowing stream. But submerge that rock slightly into the stream and it becomes quickly a reference point for our judging the swiftness and the patterning of the flowing waters above it. Thus, it is necessary to consider social flows as the duals of social gestalts and understand that flows and gestalts are almost always seen together, where one is emphasized or the other in each particular instance of perceptual or conceptual comprehension based on the system schema. Thus, when we look at a system diachronically, we are concerned mostly with flows, while when we look at it synchronically, we are concerned mostly with the various gestalts by which we pick out the entities and their interrelations.

Another important point about the systems schema is that these gestalts, as has been long recognized, are wholes greater than the sum of their parts, i.e. the whole has emergent properties that go beyond the properties of their entities and interrelations between entities. Part of that overflowing is seen in terms of the dynamic flows within the system, yet even the flows interact with each other to produce characteristics that cannot be captured by analysis. A gestalt or a flow is a pre-synthesis, what Kant calls an *a priori*, i.e. a projection prior to experience on the basis of which we perceive and conceive phenomena. That pre-synthesis has characteristics that are supervenient, i.e. emergent, which go beyond what can be discovered by reductionism and analysis. Those emergent or supervenient properties must be understood in terms of dialectics, trilectics, quadralectics⁵⁰ or some other scheme which allows for the superabundance of characteristics in the system over and above the forms and their interrelations which make it up. This emergent characteristic of the system, i.e. that it is a whole greater than

⁴⁸ Husserl, Edmund, *Ideas* : general introduction to pure phenomenology. Translated by W.R. Boyce Gibson. London : Allen & Unwin ; New York : Macmillan, 1931.

⁴⁹ Gurwitsch, Aron. *Field of Consciousness* Pittsburgh, Duquesne University Press, 1964.

⁵⁰ Fuller, R. Buckminster *Synergetics*; explorations in the geometry of thinking. New York, Macmillan, 1975-79, 2 volumes.

the sum of its parts, has always been the keystone of the identification of gestalts over and above what formalisms can describe and explain.

The Formal Structural System is a combination of three levels of schema that is endemic within our scientific way of approaching things because it has been so successful in helping us to understand nature. Formalisms give the possibility of proofs which is particularly reassuring to our rational intellects, and we wish all things we studied lent themselves to proof. However, we have discovered in the development of science that the advances we have made in mathematics are harder to win in physics and other disciplines that attempt to understand nature. We use our formalisms, both in logic and mathematics, as a means of connecting Theory (logos) and the phenomenon of nature (physis). But many times we cannot prove in a determinate manner things we would like to about the phenomena we study in a particular discipline so we resort to probabilistic explanations that are probabilistic. These explanations are usually based on the transformations of content as we move across discontinuities that present themselves in the phenomena. Thus, we create a level of understanding that deals directly with content of the forms which produces a new schema of understanding called a pattern⁵¹. Patterns may be seen in terms of time or space and thus can be either structural or process oriented. Structural Patterns explain transformative changes across discontinuities in space while Process Patterns explain transformative changes across discontinuities in time. In software engineering, when we take an Object Oriented Approach to design, we combine these by encapsulating structures within the wrapper of an object and providing operations to transform these structures which no other outside object can perform. The General Systems Theory of George Klir in Architecture of Systems Problem Solving is an example of a Formal Structural-Process Systems Theory which combines both ways of thinking about patterns in a single edifice. He does this through his hierarchy of epistemological levels which splits into meta-models (processes) and meta-structures. These pattern generating models prove very powerful ways of explaining phenomena that change discontinuously across time and space. They appeal to the changes in pattern generators that operate on the content of the forms as the basis of understanding alterations in phenomena that formalisms cannot comprehend. When this level of explanation is combined with the Formal level that offers a stronger basis of comprehension, i.e. proof, then we are able to explain many things in a cogent manner that would otherwise remain baffling. However, this does not allow us to comprehend all aspects of the phenomena and so it is necessary in those cases where we cannot explain to merely describe what we find in nature. When we describe things, our tendency now is to use the schema of the system as a basis for comprehending the interrelated entities which we observe. Our observations are of conceptual and perceptual *gestalts and flows* that cohere into the system schema that we project by pre-synthesis to encompass the phenomena under study. Thus, the Formal Patterned System is a series of fall back strategies for comprehending phenomena in general that combines in a powerful way three distinct schemas, each based on a separate analogy. Form is based on the analogy of shape or the outlines of things that we see in terms of the mathematics of algebra and geometry on the one hand and logic on the other. Pattern is based on the analogy of the warp and weft of fabric that we see in terms of processes as discontinuities in time and

⁵¹ Grenander, Ulf. Elements of Pattern Theory. Baltimore : Johns Hopkins University Press, c1996.

structures as discontinuities in space. System is based on the analogy organisms that we see in terms of gestalts and flows.

We should pay attention to Wittgenstein⁵² when he talks of *language games*. Both languages and games are systemic phenomena par excellence. It is through them that we can understand systems in nature because these are two ways that the systemic schema manifests itself within society, and this allows us to understand what systems are through our own intimate experience of systems in this form as social beings. Social Phenomenology discovers that we are already language speakers who learn these skills as children when we are also learning to play. So the system schema which starts with the analogy of organisms as pointed out by Rescher in Cognitive Systemization⁵³ is augmented in other powerful socially based analogies based on our inherent understanding of games and language which comes to us out of our social experience. Form and Pattern which we see in nature also have these social expressions. Form has two aspects: Shape and Behavior. These are seen in dance and theater and other social arts as well as in rituals where costume and special actions are performed in some institutional social context. Pattern shows up mostly in terms of handicraft such as the weaving of the cloth for the costumes that the dancers and participants in the rituals wear. Pattern shows up in the embellishment of the architectural forms that hold the performance. Pattern is decorative of the forms which participate in the play of the performance. Thus, there are social roots for all these schema by which we attempt to understand nature through the reified theoretical structure of the Formal Patterned System.

THE META-SYSTEM SCHEMA

From the familiar territory of the schemas of System, Form and Pattern we now move to a new schema that is gaining in popularity but has not yet become established except in the discipline of environmental studies and ecology. This is the meta-systemic schema which has not yet received a general name of its own. If I were to name this schema, I would call it an "Archon" after the Archons who oversaw the city in Greece. An Archon was a magistrate in the historical setting of Athens after the establishment of democracy. The Archon had some functional purview over the whole city which was split out from that assumed previously by the king. The city is the perfect analogy of the meta-system in that it is an environment in which households flourish and interact. The Archons are the ones who oversee the functioning of the household environment and, for instance, regulate the markets or oversee preparation for war with other cities or administer justice. The functions of the archon are hidden in and subsumed by the king, but when the king is deposed as in the fledgling democracy of Athens, then these functions have to be taken over and performed by others who must coordinate their efforts. The Archon is the symbol of the deconstruction of the unity of kingship and, thus, specifically points to the

⁵² Wittgenstein, Ludwig. Philosophical Investigations Translated by G.E.M. Anscombe. New York, Macmillan 1953

⁵³ Rescher, Nicholas. Cognitive Systematization: a systems-theoretic approach to a coherentist theory of knowledge, Totowa, N.J. : Rowman and Littlefield, 1979.

environmental aspects of the city as a place for households to develop and interact which would otherwise be hidden by the unification of kingship. The meta-system has a similar relation to the super-system. A super-system is a system made up of sub-systems which are, in turn, made up of sub-sub-systems to some degree of hierarchical nesting. Each level is seen again as a gestalt/flow whole that is greater than the sum of its parts. However, we do not often look at the dual of the super-system which I have dubbed the meta-system, i.e. the deconstructed whole which is less than the sum of its parts. That whole is the environment itself as the origin and arena of systems at some level of abstraction. It is different from a system itself because it operates as an “operating system” supporting the systems that it contains. Thus, we only see the meta-system when we deconstruct the super-system (king) and see instead the intervening intermediate level of organization within the super-system that acts as an environment for encapsulated sub-systems. The analogy of the meta-system to the system is like the relation between the universal turing machine to the turing machine. It is like the computer operating system to the application that operates within that operating system. The meta-system is broken up into archonic functions which give resources to and regulate the systems that are allowed in its environment. The environment in this sense acts as a filter because only certain systems can operate within a specific meta-system. The meta-system is inherently disunified and thus the archonic functions within it are generally orthogonal although they have to cooperate in order to produce an environment which facilitates the growth and development of the kind of systems that are allowed in its niches.

Meta-systems are inherently complementary in their organizations rather than unified. They are totalizing rather than unified in that they contain the totality of complementary opposites that provide the necessary archonic operational resources and regulation of the systems. Sartre, in The Critique of Dialectical Reason⁵⁴ calls the meta-system a detotalized totality because it is never a static totality but a dynamic totalization by which the various orthogonal archons cooperate through shared complementarities to produce an optimal environment for unified systems and anti-systems that appear within it and are enveloped by it. The meta-systemic environment is composed of niches, which are holes, which make it less than the sum of its parts. These holes are exactly fitted to the kind of systems that the filter of the meta-system allows. Within the meta-systemic environment, systems within their niches are created, given resources of various kinds, and are eventually destroyed such that their constituent elements are recycled back through the meta-system to produce other systems. All interactions that a system has with its meta-systems are through complementary opposites. Thus, the attributes of the meta-system is always pairs of complementarities as seen from the point of view of the systems within it. These complementarities can be deeply nested as complementarities of complementarities much like the nesting of the sub and sub-sub systems within the super-system. When super-systems are taken apart, they appear as meta-systems. One may think of the meta-system as a field of tendencies which dictates the order of assembly of the super-system out of the sub-systems that appear within meta-systemic milieu hidden within the super-system. For this reason, when we think about design landscapes, we are necessarily talking about meta-systemic fields.

⁵⁴ Sartre, Jean Paul, Critique of Dialectical Reason Translated by Alan Sheridan-Smith ; edited by Jonathan Rée. London : NLB, 1976.

Culturally we have difficulty thinking about meta-systems. Today we generally reduce them to systems, or nested super-system complexes, which suppress their extremely different characteristics that are, in fact, the dual of those characteristics of systems. Systems are unified and meta-systems are detotalized totalities. Systems have their dual within the meta-system where we see anti-systems emerge, but where meta-systems are nested complementarities, systems are made up of singular parts or functions. Systems only develop complementarities in relation to and by their adaptation to their meta-systemic environment. We use the term "meta-system" because if we take the system through its series of higher logical types,⁵⁵ we find that the meta-system is related to its rules, like the rules of a game or the grammar of language. The rules are the constraints that the meta-system places on the system while it is in its environment. The next higher meta-level of the system is the properties of the pieces in the game or the properties of the markers in language like the phonemes which are allowed within the meta-systemic environment. The next higher meta-level of the system is the constraints on the system and exceptions to the rules which determines the freedom and determinism under which the system is operating. Each of these meta-levels of the system refer to the relation of the system to the meta-system. Here the term "meta" refers to all the meta-levels of the system operating on it at once. But each schema should have its own name other than by reference to another level of organization of phenomena. That is why we have suggested the term Archon which is related to the term that Jung uses for structures in the collective unconscious which he calls "complexes" or "archetypes." The term complex and the term archetype are suitable for use when describing meta-systems because Jung attempted to describe the Totality of Consciousness which he called the Self which was composed of the system of the Ego and the anti-system of the Shadow and various archetypes, which were higher level nested complementary formations that intervened between the level of the unity of the Ego and the totality of the Self that included both the conscious and unconscious in one whole. We can see the Self as super-system, as Nietzsche did when he posited the uberman as the impending fated arrival of what was other than human within humanity (but which never actually arrives), or we can consider consciousness as a field full of complementary complexes in which various numinous loci like that of the ego interact beyond the filter of consciousness. This model is similar to that of the region full of communities (city states) which are again full of neighborhoods which contain households which are based on marriage. All of these are meta-systemic levels of organization within society. Our culture has difficulty recognizing and dealing with these amorphous types of human organization which are rooted in the meta-systemic "field" view of nested environments. Our stewardship of these aspects of our own society is very poor; because they are amorphous, they receive little attention and are easily destroyed by highly organized systemic institutions. Meta-systemic institutions are social archetypes. You notice that each of the archetypes that Jung points out like the Anima, Animus, Wise

⁵⁵ For a more in-depth analysis of the relation of this view of systems theory to systems engineering see the author's "Meta-systems Engineering: A New Approach to Systems Engineering based on Emergent Meta Systems and Holonomic Special Systems Theory", International Council of Systems Engineers (INCOSE) 2000

Old Man, Cathonic Female⁵⁶, etc. are symbolic internalizations of some aspect of society, some type of person or some type of relationship between different types of people in society. That is why he calls it the collective unconscious. But it is the dual of the outward amorphous relations which appear as standing wave patterns in the meta-systemic field of society such as region, community, neighborhood, family, marriage which mediate between the abstract organized and systemic institutions of society and the individuals within it.

Meta-systems exist as nested complementarities. The first level complementarity with respect to the system is that the meta-systemic field is the *origin* and *arena* within which the system arises and interacts with other systems including anti-systems, i.e. complementarity images of itself. An example of system and anti-system pairing in society is the gender distinction. In fact, this is probably the most basic complementarity within our society, and it is rooted in nature based on the distinction between male and female that we discover in ourselves. However, gender ascriptions are not directly tied to these natural and physical markers but instead form a field of signifiers within society. But the next level of meta-systemic nesting of complementarities is that of the meta²-system which includes the conjunction of *origin* and *arena* with *source* and *boundary*. The arena is bounded, and whatever has an origin within the system must also have a source. The origin is the spacetime point of entry into the meta-systemic field. The source is the endless-timespace template from which the system is patterned. In software, there is a distinction between an object and its instance. The object as a template for data structuring, and behavior is the source while the concrete instance of that object as it enters the system given memory and CPU⁵⁷ cycles and initialized with specific default values in variables is the origin. In the meta²-system, we see that the meta-system establishes the limits of its control and filtering via the boundary, and what it establishes is a priori patterning of the systems that are allowed to emerge within it, while once they appear at a specific origin, then they develop through their interaction with other systems until they are terminated by themselves, other systems or the meta-system. The meta-system is infinitely nested through a series of metaⁿ-system levels of environmental articulation. This is another sense of “meta” than that used when we considered the various higher logical types of the system. That series only has three levels. This sense of meta is the higher and higher level complementarities as the meta-system expands to embrace wider and wider environments which is the dual of the nesting of systems within systems of super-systems. At each level of nesting of meta-systems, there is a new conceptual level of complementarity that arises.

For instance, *Origin / Arena // Source / Boundary* has a dual which is *Generator / Encompassing Regress // Root Singularity / Subspace Regress* at the meta³-system level. The generator is what takes the source template from the endless realm outside of timespace and produces a system at a particular origin within the spacetime boundary of the meta-systemic field. The encompassing regress is the series of encompassing fields

⁵⁶ Note that these archetypal patterns in the masculine and feminine psyche are patterned on age related groups of the parents at marriageable age (Animus, Anima) and the grandparents (Wise Old Man, Cathonic Female).

⁵⁷ Central Processing Unit

beyond the boundary of the meta-system. The subspace regress is the series of differentiations of the sources which recede infinitely differentiating in the progressive bisection of Pascal's triangle. This regress of sources, which is based on the Cayley-Dickson algorithm⁵⁸ for the production of Hyper Complex Algebras, produces negative dimensionality⁵⁹ which is the opposite of the positive dimensionality of the encompassing regress. The root singularity is like the origin in spacetime and the source in the subspace only at the next level deeper. It is the meta-source of the sources in the subspace. The root singularity is the nexus of actualization of the sources. In software engineering terms, if the sources are the object templates that are the basis of instantiation of actual instances of those object templates in the spacetime of memory and CPU cycles within the computer, then this singularity would be the root object from which all the templates are built, i.e. the meta-template. It is singular and unique as the root of all objects that are produced through inheritance from it. This differentiation of the meta-systems is infinite following the form of Pascal's triangle down into an infinite regress of subspaces giving us more and more possible complex environmental formations based on complementary duals. The next level has sixteen elements and is not completely understood as yet.

If we want a concrete example of this differentiation of the meta-systems into the various levels of encompassing, we can think of a highway. Each lane is an arena for traffic flowing in a specific direction. We produce a conjunction of the two lanes to create a roadway because it is more efficient to have the traffic adjacent than travel different paths. We can see that each lane has its sources (on ramps) and sinks (off ramps) as well as the boundary of the verge of the roadway. The lanes are the arena in which the systems of the cars operate, and each car has a particular origin and destination as it moves through the roadway meta-system. When we go up to the next level, we have to consider the sources of the cars which are automobile sales companies and the fuel sources, which are gas stations. The generators of the automobiles are the factories that create them. The end of the production line is the ultimate point of origin for the automobile which then goes to showrooms. The showrooms are the purchasing source or place for the general public to buy the automobiles. The encompassing regress can be seen in the fact that the automobile transportation system is only one of many different kinds of transportation that are knit together to give us the ability to move from place to place on the planet. The

⁵⁸ Narin, Stephen. The Cayley-Dickson Process. Thesis (M.A.)--University of California, Santa Barbara, 1974.

⁵⁹ Normally negative dimensionality is not recognized in geometry. It is a recent realization of the author that negative dimensionality follows the Pascal triangle of the Cayley-Dickson process down to infinity so that negative dimension is a subspace of sources which is the dual of the points of origin in normal positive dimensionality. Sources are everywhere while origin points are specifically located but dimensionless. Negative dimensionality appears in this way because the first dimension past zero is negative one which is the singularity where the imaginaries appear. Thus the subspace of negative dimensionality is entirely imaginary and is a horizon of all possible sources at some level of hypercomplex algebra. In this space there is one source at negative dimension one giving an imaginary algebra, three at negative dimension two giving a quaternion algebra, seven at negative dimension three giving an octonion algebra, fifteen at negative dimension four giving a sedenion algebra, etc. In other words, negative dimensionality is imaginary and is not merely the inversion of positive dimensionality which is meaningless mathematically. There is an important phase transition between positive and negative dimensionality at negative dimension one which has not been recognized by geometry or algebra. Algebras form the underpinning of geometry in the subspace of negative dimensionality.

subspace regress shows up when we consider that all those other modes of transportation have their own generators and sources. Transportation meta-systems interlock to form a larger and deeper meta-systemic complex made up of various meta-systems. The singular root is the concept of an automobile from which many source designs spring to give us a variety of models as templates for a variety of instances. The generator takes these sources and instantiates them into different individual automobiles which participate in the meta-system. This occurs in each of the realms with various models of planes appearing from the root concept of the plane and thus leading to various sources of planes from different manufacturers. The network of various kinds of transportation is merely one kind of meta-systemic nesting within a world that has many other meta-systemic facets like government, agriculture, textiles, etc. All these meta-systems are nested at some deeper level of meta-systemic nesting that gives the world coherence.

Meta-systems were described by Bataille in the Accursed Share as "general economies." They are diametrically opposed to "restricted economies," and seem irrational from the viewpoint of systems. This is because they contain catastrophes, singularities, miracles and black holes. Catastrophes were described by Rene Thom⁶⁰ as geometrical formations that show how discontinuous changes may take place in time. Singularities are the same thing with respect to space, i.e. points of anomalous discontinuous properties within the field of the meta-system. Miracles and Blackholes are two opposite sorts of positive feedback in an increasing or decreasing direction. In general, we try to avoid the meta-systemic environments like the plague because when we are in them, things are out of our control, like the stock market which seems to have chaotic behavior full of booms and busts. We want the miracles but dread the black holes. Similarly, we want to avoid the catastrophes that occur at the cusps that Rene Thom describes, but we would like to find the mother lode, i.e. that singular point in the landscape which is filled with a vein of gold.

Another important point is that, just like the system can be either seen as a gestalt or flow, so the meta-systemic archon can be seen as either proto-gestalt or proto-flow. This is understood when we realize that when we look around, we move from gestalt to gestalt so that the various gestalts are like figures on the background of the proto-gestalt that is at another level of organization underlying the gestalt. Gestalt is figure-on-ground, but the gestalt as a whole appears on the background of the proto-gestalt. This proto-gestalt has what David Bohm⁶¹ calls *implicate order*. It is a kind of unfolding order that is implicit rather than explicit and guides our gaze as we move from gestalt to gestalt. The same is true of the flow; it is seen on the background of the proto-flow. When we look into a stream, we can see various streams in relation to other streams flowing at different rates and moving in different directions depending on the undulations of the riverbed and the stones that block the path of the water in the stream. Our gaze moves from stream to stream within the overall flow based on an implicit ordering encoded into our experience which guides what we notice and what we do not notice. Thus, we can relate the meta-systemic archon schema directly to perception and conceptual grasping just like we did

⁶⁰ Thom, René, Mathematical Models of Morphogenesis Translated by W.M. Brookes, D. Rand. Chichester : Ellis Horwood ; New York : Halsted Press, 1983.

⁶¹ Bohm, David. Wholeness and the Implicate Order London ; Boston : Routledge & Kegan Paul, 1981,

the system. We can also see its social origins because we have always lived with others in environments whether man-made or natural, and these environments were all organized at various extents to facilitate what goes on within them. In social phenomenology, there is a concomitant construction and invention of environments which we call archi-ecture, city planning, and regional planning⁶² that underlies and goes hand in hand with the social construction and invention of social gestalts and flows. We project the proto-gestalts and proto-flows just as much as we project the gestalts and flows that take place in those environments.

A key point is that the system that is a whole greater than the sum of its parts is the dual of the meta-systemic archon which is a whole less than the sum of its parts. This understanding of the difference between surplus and lack is the fundamental distinction between the system and the meta-system. This distinction is necessary because the meta-system has niche holes in it just right for the systems it was made for and to fit into and vice versa. This close fitting of the systems into the meta-systems is a major problem in software called the portability and interoperability issue. The creation of the internet is based on the production of a solution to these issues based on TCP/IP protocol and other similar protocols like HTTP which operate on the top of TCP/IP. The layering of protocols allows the solution to the interoperability problems. Portability is still an issue being addressed by Java and other multi-platform languages. Much of our knowledge about meta-systems comes from this kind of work in software engineering where we discover, on the basis of trial and error what works and what will allow this new level of integration of our systems through the new medium of cyberspace⁶³. We must specifically design systems and the meta-systems in which they are embedded so that interoperability and portability can be achieved. The niches, and the things that fill those niches, need to be designed to have the right kind of reciprocity and we are learning how to make the operating systems reciprocal with each other as we go up to the next level of nesting of complementarities. If you look at protocols, you can see that they are all about reciprocal and complementary actions. Protocols are a good model about how meta-systems interoperate and allow the exchange of their systems with each other.

If form lends itself to proof, and pattern to explanation, and system to description, then what is the basis in understanding that meta-systemic archons lend us? Here we will appeal to Polanyi's concept of Tacit Knowledge⁶⁴ which underlies all our attempts to express knowledge discursively. What can be expressed discursively is merely the tip of the ice berg in relation to what we know tacitly from our embedding in the world. Meta-systemic knowledge is largely tacit and submerged as a substrata of our systemic descriptions. But if we make this tacit knowledge explicit then it appears as concepts like David Bohm's concept of the Implicate Order. In other words, it appears as the consciousness of how hidden aspects of things control our comprehension of the visible

⁶² Alexander, Christopher. The Timeless Way of Building New York : Oxford University Press, 1979.
Alexander, Christopher. A Pattern Language : towns, buildings, construction with Sara Ishikawa, Murray Silverstein, Max Jacobson, Ingrid FiksdahKing, Shlomo Angel. New York : Oxford University Press, 1977.

⁶³ See "Thinking Through Cyberspace" a presentation by the author at <http://dialog.net:85/uciconf1/index.htm>

⁶⁴ Polanyi, Michael, The Tacit Dimension Garden City, N.Y., Anchor Books 1967, c1966 1962.

aspects of things. The meta-system as proto-gestalt or proto-flow, is the deeper background underlying our experience of systemic gestalts or flows. Another way we understand the relation between systems and meta-systems is linguistically, in relation between count and non-count nouns, i.e. between things and stuff (See Ecological Understanding⁶⁵). Our culture and language exalt countable and quantifiable things over uncountable and qualitative stuff. Meta-systems or proto-gestalts are inherently more qualitatively experienced than the countability of systemic gestalts. We allude to the meta-systems in our language. These allusions are normally amorphous and indeterminate rather than determinate and precise like the relation between countable and uncountable nouns in our language. Some languages such as Chinese have a greater emphasis on “non-count” or “mass” or “stuff,” as ways of looking at things. With mass, or non-count nouns, the individual instances are submerged and become indistinct in the overall grouping which has its own emergent characteristics. We allude to these characteristics that cannot be determinably isolated and made precise and distinct. Allusion is something we tend to deprecate in our scientific narratives which strive toward isolatability and rigor. But just because we must allude to our tacit knowledge of implicate order, does not mean that meta-systems do not have their own kind of articulation. When we are articulate about the decomposition of meta-systems, we point out their myriad complementarities which may indeed be generalized in relation to the system. Whenever the unity of the system encompasses opposites then we can easily suspect that it is interfacing with a detotalizing totality of a meta-system. But with things those that are opposite the features of the system, we get indications or allusions to the tacit complementarities of the stuff of the meta-systemic archon. From the point of view of the system these allusions resolve because of the disunity of the meta-system into so many illusions, shadows or hauntings. These arise from the multiple perspectives of the holographic meta-system within which the systemic gestalt is seen. In the hologram the parts allude to the whole but do not encompass it completely because each part is seen from a splintered set of perspectives. The holoidal meta-system encompasses these myriad viewpoints from which the systemic gestalt may be seen within the social milieu.

THE HOLONIC SCHEMA

When we look at the System Schema and the Meta-system Archonic Schema, we note that in the first the whole is greater than the sum of the parts, while in the second the whole is less than the sum of the parts. This makes sense when we think of the meta-system as a field because any field with nothing in it represents a lack, because a field is precisely a place for something to be, i.e. a holder of something, say a system. Systems, on the other hand, are gestalts which give an overall impression that is more than merely the sum of their parts with global properties that the parts by themselves do not exhibit. But this raises the question as to whether it is possible for there to be a whole which is exactly the sum of its parts. It turns out that this is possible in rare cases in which something which is a cross between a field and a system is produced anomalously. What we find is that these anomalies have a very specific structure which has an unexpected foundation in mathematics and the understanding of which drives us into a wholly

⁶⁵ Pickett, Steward T., Ecological Understanding With Jurek Kolasa, Clive G. Jones. San Diego : Academic Press, c1994.

different way of looking at phenomena different from either the systemic schema or the meta-systemic schema. This is a big leap because we are not used to thinking about things in terms of meta-systemic archons or fields. So now, to ask for an even bigger conceptual leap stretches not just our credibility, but also stretches our ability to imagine what the cross between a field of niches and systems might be like. These partial systems and partial meta-systems have been called "Special Systems." They could very well be called "Special Meta-systems instead." But the best name, the most descriptive name for the special schemas are Holons, after Koestler's usage in Janus. The study of these special systems is called Holonomics, i.e. because it looks at the Nomos (ordering) of the Holons. Holons, according to Koestler, are things like the organs in the body which are at once parts and wholes, just as the special systems are at once systems and meta-systems.

Looking carefully into the matter, we find that between the emergent level of the system (as social gestalt) and the emergent level of the meta-system (as social proto-gestalt), there is a series of hinges⁶⁶ which are partial combinations of systems and meta-systems. There are three such emergent levels of these special systems which we will call the *dissipative ordering special system* which is in reference to the work of Prigogine on dissipative neg-entropic structures, and *autopoietic self-organizing special system* which is in reference to the work of Maturana and Varela, and *the reflexive social special system* and which is in reference to the work of O'Malley and Sandywell. At each level, we use an existing theoretical framework as a point of departure for coming to terms with the characteristics of that particular emergent level. However, the crux of our definition of these levels is its basis, in Hyper Complex algebras⁶⁷. If we consider Systems as operating with real algebras as their basis then we can think of Dissipative Special Systems as operating with the imaginary algebra which is fundamentally the same as its basis. The Autopoietic Special System has the quaternion algebra which loses the commutative property as its basis, and the Reflexive Special System has the Octonionic algebra which loses the associative property as its basis. The Meta-system can be described by the Sedenion algebra which loses the division property or higher non-division algebras as its basis. All the higher algebras beyond the Sedenion are basically the same because there are no more interesting properties to be lost as we apply the Cayley-Dickson procedure to generate the even higher algebras which follow Pascal's triangle out to infinity. Special Systems have the Hyper Complex Algebras⁶⁸ as the basis of their ordering, and this drives the theoretical considerations concerning how they are represented rather than the specific theories by theorists who have attempted to describe phenomena similar to those found that correspond to the special systems. In effect, we use the theory of these algebras which were discovered by Hamilton⁶⁹ and Graves toward the middle of the nineteenth century. This form of mathematics has not really found any fundamental use in physics as yet, even though Hamilton had high hopes for them when he discovered them. Nothing could be done with the special properties of quaternions that

⁶⁶ Or hiatus, or lacuna, or moments, or loci

⁶⁷ See <http://www.innerx.net/personal/tsmith/Dixon.html>

⁶⁸ Kantor, I. L.. Hypercomplex Numbers: an elementary introduction to algebras. Translated by A. Shenitzer. New York : Springer-Verlag, c1989.

⁶⁹ Graves, Robert Perceval. Life of Sir William Rowan Hamilton New York : Arno Press, 1975. See also Hamilton, William Rowan, Sir Elements of Quaternions, By the late Sir William Rowan Hamilton ... Ed. by his son, William Edwin Hamilton ... London, Longmans, Green, & co., 1866.

were not more simply and easily done with vectors. Thus, quaternions⁷⁰ and octonions⁷¹ have fallen into an obscure part of mathematics that is not really studied very much by mathematicians because they are considered known. Some physicists have resurrected them to form an integral part of their physical theories of the universe, but these are fringe attempts for the most part which have not found wide acceptance⁷². Quaternions are sometimes used to program the motions of robot arms, but beyond that there is little use for them even though many problems may be viewed usefully in terms of this strange kind of mathematics. Here we resurrect the mathematics of Quaternions and Octonions to be the basis of our theory of holons, and read off from that theory the strange and wonderful properties of holons which we look for in real holonomic systems. The transformation from mathematics to holonic systems theory comes from the realization that the loss of algebraic properties produces a gain in systems theoretic properties. So, for instance, when we move from the real algebra to the imaginary complex number algebra, we gain the strange property of conjunction. The little plus sign between the elements of the complex numbers does not mean they will be added but instead means that they will be conjuncted, i.e. always juxtaposed and held together. Essentially an imaginary number is just like a juxtaposition of two real numbers in a vector. But when conjuncted, these two real numbers undergo a symmetry breaking in which one becomes imaginary and the other remains real. This symmetry breaking occurs at each level of the unfolding of the hyper complex algebras. A quaternion is the conjunction of two complex numbers which undergoes a symmetry breaking so that they appear as one real and three imaginaries. An octonion is a conjunction of two quaternions or four complex numbers that go through a symmetry breaking that turns them into one real and seven imaginaries. At the level of the sedenion, which has sixteen elements, there is a conjunction of two octonions, four quaternions or eight complex numbers that undergoes a symmetry breaking to produce one real and fifteen imaginaries. Traditionally the real and complex algebras were considered the most interesting because they had the most properties. But over time, interest in the quaternions and octonions have grown, but still they are seen as deficient because the first loses the commutative property and the second loses both that and the associative property. Sedenions are considered extremely uninteresting because it

⁷⁰ Altmann, Simon L. Rotations, Quaternions, and Double Groups Oxford [Oxfordshire] : Clarendon Press ; New York : Oxford University Press, 1986. See also Hardy, Arthur Sherburne, 1847-1930. Elements of Quaternions. Boston, Ginn, Heath, & co., 1881. See also Hathaway, Arthur S. A Primer of Quaternions New York, Macmillan and co.; London, & co., ltd., 1896. See also Joly, Charles Jasper, A Manual of Quaternions. London, Macmillan and co., limited; New York, The Macmillan company, 1905. See also Kelland, Philip, Introduction to Quaternions, with Peter Guthrie Tait. Prepared by C. G. Knott. London, Macmillan; New York, Macmillan, 1904. See also Macfarlane, Alexander, Bibliography of Quaternions and Allied Systems of Mathematics Dublin, Printed at the University Press by Ponsonby and Gibbs, 1904. See also Tait, Peter Guthrie, An Elementary Treatise on Quaternions Oxford, Clarendon Press, 1867. See also Ward, J. P., Quaternions and Cayley Numbers: algebra and applications. Dordrecht ; Boston : Kluwer Academic Publishers, c1997.

⁷¹ Helmut Salzmann. Compact Projective Planes : with an introduction to octonion geometry. Berlin ; New York : Walter de Gruyter, 1995. See also Okubo, S. Introduction to Octonion and other Non-associative Algebras in Physics Cambridge ; New : Cambridge University Press, 1995. See also McAulay, Alex. Octonions : A Development of Clifford's Biquaternions. Cambridge, [Eng.] : University Press, 1898. See also Dixon, Geoffrey M. Division Algebras: octonions, quaternions, complex numbers, and the algebraic design of physics. Dordrecht ; Boston : Kluwer Academic Publishers, c1994.

⁷² See Tony Smith's theory of everything at <http://www.innerx.net/personal/tsmith/TShome.html>

loses even the division property ⁷³. So it almost seems as if there are no properties left when the sedenion is compared to a full algebra of the reals or complex numbers. What we see from a systems theory perspective, is that when the quaternion, and thus the Autopoietic Special System, loses the commutative property, then that makes mutual action very interesting because you can no longer reverse actions with impunity. When the Octonion, and thus the Reflexive Special System, loses the associative property, then that makes the social aspects of the associations between things very interesting because you can no longer associate things with impunity, in other words, it matters who sits next to whom at the dinner table. Losses of mathematical properties are a gain in interesting systemic properties. So, for instance, when the division property is lost at the level of the Sedenion Algebra and thus the Meta-system, we find that interesting because that is what allows us to enter the field completely, i.e. it is hard to divide a field into pieces. The various special systems (or special meta-systems) are emergent steps toward this submersion into the field. We can see it as steps that the system goes through when it appears or when it vanishes. System articulation or system disintegration goes through this series of emergent stages in which the ordering fundamentally changes in very strange ways. It behooves us to understand these changes of structure because that underpins the many anomalous systems that, though rare, are very familiar. We find them everywhere on our earth: neg-entropic far from equilibria thermodynamic systems, living systems, and social systems. In the universe as a whole, they may be rare, but on our planet, there are very many of them, and so it is a good idea for us to understand these holonic forms, if only because we are an example of them ourselves.

But let us go back and think about the idea of wholes exactly equal to the sum of the parts. There is a simple analogy for this in the perfect, amicable and sociable numbers ⁷⁴. A perfect number is one whose divisors add up to the number itself, neither more nor less. An amicable number is a pair of numbers that do the same thing for each other, i.e. the divisors of one add up to the other's total and vice versa. Perfect and Amicable numbers have been known since ancient times. But recently it has been discovered that there is such a thing as Sociable numbers in which there is a set of numbers that, in a cycle, the divisors of one add up the totality of the next. What is interesting about this mathematical anomaly is that it gives us an excellent model of the dissipative, autopoietic, and reflexive special systems. A dissipative special system is like a pair of amicable numbers which together gives us an autopoietic organization in which symbiotic pairs produce a greater whole. The smallest amicable pair is 220 and 284 which was known from antiquity. Perfect numbers are a good example of the autopoietic system itself. If we iterate the finding of divisors and the adding of them, then we are continually producing the whole of the number from its parts, and the parts are exactly equal to the whole. Examples of such numbers are 6 and 28. Sociable numbers ⁷⁵ are like reflexive special systems. Many of the sets of sociable numbers come in groups of four

⁷³ See <http://www.innerx.net/personal/tsmith/sedenion.html>

⁷⁴ Yan, Song Y. *Perfect, Amicable, and Sociable Numbers*: a computational approach. Singapore ; River Edge, J. : World Scientific, c1996. See also <http://xraysgi.ims.uconn.edu:8080/amicable.htm> See also <http://www.vejlehs.dk/staff/jmp/aliquot/tables.htm> and <http://www.vejlehs.dk/staff/jmp/aliquot/apstat.htm>

⁷⁵ See <http://xraysgi.ims.uconn.edu:8080/sociable.txt>

such as 1264460, 1547860, 1727636, 1305184⁷⁶. These four numbers each produce each other in a cycle and form a mutually constitutive cycle in which the wholes are equal to the sum of the parts. But it is not this whole; rather it is another whole in the cycle. This is similar to the amicable numbers except with more members in the set of mutually constitutive numbers. Perfect numbers are very rare, Amicable numbers are incredibly plentiful and Sociable numbers are again rare but not as rare as Perfect numbers. These kinds of numbers revealed by number theory give us a hint about the way that these special systems are organized. Only their organization is more deeply based on the hyper complex algebras which are instead more complicated than these simple number theoretic objects. We cannot here go into all the properties of these hyper complex algebras. We invite the reader to study this kind of mathematics because it is fascinating to know just how different holons are different from what we are used to in terms of mathematical ordering. Hopefully, the analogy of the Amicable, Perfect and Sociable numbers gives a kind of a hint as to the nature of what these systems are like. We advocate a building of a holonomic theory that is based closely on the mathematics of hyper complex algebras rather than the ungrounded theorizing that now exists concerning self-organizing and social systems. For instance, we find that if we study autopoietic theory as it now exists, we find that it is incommensurable with the new basis that has been discovered in hyper-complex algebras⁷⁷. On the other hand, the theories of Prigogine concerning dissipative structures and the theories of O'Malley and Sandywell are more conducive to direct interpolation in the context of the mathematical foundations of Holonomic theory.

The interesting thing about Special Systems theory is that these anomalous and rare systems are neg-entropic and because of that, they are ultra-efficient (ultra-efficient and ultra-effective). These properties of ultra-efficientness come from the suppression of entropy locally (at the price of increase globally), which when compounded at the autopoietic and reflexive emergent levels, yields some very interesting systemic properties in these special systems. Ultra-efficientness means that these systems have an advantage over normal systems that operate in the realm of entropy, which, though probabilistic and small, over time prove to be at a large advantage. That is why when life, consciousness, and social aspects of systems appear on our small planet, they take over and proliferate. Evolution has exploited this ultra-efficientness in the production of life, consciousness and socialization in animal and human evolution, so it behooves us to study these special kinds of systems and see whether we can take advantage of any of these properties in other endeavors.

Special systems are very different from other kinds of systems because their main way of being organized is through the conjunction of elements, and this conjunction of individuals that are alike goes through a phase shift to produce an asymmetry where there is one real and n imaginaries, where $n=1, 3, 7, 15 \dots$ and so on. The relationship between the imaginaries are what is strange about the hyper complex numbers. The imaginaries

⁷⁶ There are other cycles, however. "There are 60 [known] cycles in all: 53 of length 4, 1 of length 5, 2 of length 6, 2 of length 8, 1 of length 9, and 1 of length 28." See A LIST OF ALIQUOT CYCLES OF LENGTH GREATER THAN 2 at <http://xraysgi.ims.uconn.edu:8080/sociable.txt> by David Moews.

⁷⁷ See "Autopoietic Meta-theory: Paradox and Supra-rationality" and "The Ontological Foundations of Autopoietic Theory" by the author at <http://server.snni.com:80/~palmer/autopoiesis.html>

exist as parts and wholes at the same time in relation to each other, and that is why they are a good model for holons. They give us a good model of interpenetration or what Aczel⁷⁸ calls HyperSets. HyperSets allow classes to be members of themselves. Hyper Complex numbers allow mediated hypersets where elements can be members of themselves through the mediation of another imaginary in the series. The mediated hyperset is an image of the kind of interpenetration of everything with everything. This is the kind of interpenetration that we find in Buddhist metaphysics which is called the Jeweled Net of Indra⁷⁹. In this image, all the jewels in the network are reflecting all the other jewels in the network. The series of infinite reflections within reflections within reflections of different things in the set with each other forms the hyperset. Onar Aam⁸⁰ noticed that it is possible to construct an analogy of the Hyper Complex Algebras by using mirrors. A single mirror reflecting the world is like the Real Algebra and the normal System. Two mirrors facing each other and reflecting the same thing in an infinite regress is a picture of the Imaginary Complex Algebra and the Dissipative Special System. Three mirrors facing each other and reflecting in a cycle infinitely is a picture of the Quaternion Hyper Complex Algebra and the Autopoietic Special System. Four mirrors facing each other in an inwardly mirrored tetrahedral orientation is a picture of the Octonion Hyper Complex Algebra and the Reflexive Special System. The Sedenion and higher Hyper Complex Algebras can be seen as a mirror house where distorted and non-flat mirrors form inwardly mirrored spaces of reflection. They are the image of the various levels of the Meta-system where the division property is lost, and thus there is complete fusion of the field into a single dynamic multi-dimensional topology.

Holonomics is a new discipline which, at the moment, is based on just a few physical examples. For instance, we can think of solitons and instantons in physics as a model of the Dissipative Special Systems. For the autopoietic special systems, we have the model of superconductivity of Cooper pairs. For the reflexive special system, we have the macro-quantum mechanical properties of the Bose-Einstein Condensate which has been recently shown to actually exist. Each of these anomalous physical phenomena has structures that are reminiscent of the mathematical ordering of the hyper complex algebras at one or another of the emergent levels. They are enough to show that the hyper complex algebraic orderings can exist in physical phenomena and thus ground our science of anomalous rare formations which are contrary to the norm. Science encounters these anomalies but has no general theory to attempt to understand them through. Holonomics supplies this general theory and gives us a basis for searching for similar formations in different realms of phenomena. Because of Holonomics, we no longer need to only look for systems or their environments; we can, instead, look for intermediate formations like the family, neighborhood, community, and region which only exist on the basis of conjunction and on the phase transition into imaginary spacetime partial fields. Holonomics gives a new basis for the consideration of ecology and environmental studies which perhaps, can now accept that there are formations that are not systems nor

⁷⁸ Aczel, Peter, Non-well-founded Sets. Foreword by Jon Barwise. Stanford, CA : Center for the Study of Language and Information, c1988.

⁷⁹ Cook, Francis Harold, Hua-yen Buddhism: the jewel net of Indra. University Park : Pennsylvania State University Press, c1977.

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environments, but something halfway in between and formed through the conjunction of elements in a field like an array which undergoes a phase transition into an imaginary space. In this imaginary space, there are archons, or archetypes or architectures that arise spontaneously and give some kind of partial ordering to the elements that is somewhat intangible or fuzzy or amorphous but is precisely described by Hyper Complex algebra.

What is exciting about this notion from the point of view of the life sciences, or the psychological or social sciences, is that it gives a scientific basis that has been sought since the founding of these less exact sciences. Now there is a way to provide a mathematical underpinning through the holonomic interpretation of Hyper Complex algebras for what was seen previously as too amorphous and unquantifiable. Holonomics maps out a realm halfway between quantity and quality because each of the elements in an imaginary field has its individual character given by its place in the field. Holonomics is a natural meeting place between the so called hard sciences and soft systems characteristics that are difficult to quantify and qualify. The partial submersion in the field that occurs with holonomic systems is what makes them difficult to quantify with discrete mathematics -- instead, there is a different mathematics which describes these systems very precisely similar to the way fuzzy numbers give us a way of describing the gray areas between discrete black and white positions.

EMERGENT META-SYSTEMS THEORY

The Emergent Meta -system (EMS) is a special combination of the three kinds of special systems with the normal system which approximates the structure of the meta -system which produces it through a dynamic unfolding. It is similar to what Ben Goertzel⁸¹ calls a Self-Generating System in Chaotic Logic⁸². The Emergent Meta -system is a diachronic loop through the various kinds of algebras going from the real to the complex to the quaternion to the octonion to the sedenion and back to the real. It forms a very specific path which is thought of in terms of nodes and meta -operators. This emergent meta-system formation is an image of creation ex -nihilo, i.e. the arising out of the field of a system and the return to the field⁸³. *This arising and return goes through a series of four stages. We start off with seeds in a pod which through a creation operator produces monads in a swarm. Then these monads interact through a mutual action operator to produce viewpoints in a constellation. Then these viewpoints together form a gestalt pattern formation which produces candidates in a slate. These candidates annihilate with each other until only the side effect of seeds are left. This cycle can be repeated indefinitely to produce what has been named annihilation mosaics, i.e. formations of cascades that produce side effects from the annihilations in a series of iterations.*

⁸¹ ben@intelligenesis.net See <http://www.intelligenesis.net/> See also <http://goertzel.org/>

⁸² Goertzel, Ben. Chaotic Logic : language, thought, and reality from the perspective of complex systems science. New York : Plenum Press, c1994.

⁸³ See Ons -- a theory of truly elementary particles, explaining the emergence of structure from void in psychology and physics; See also Universe as Network: The Standard Model plus Gravity as a Consequence of Simple Transformation Rules on Discrete Event Networks with Tony Smith, Onar Aam and Kent Palmer; See also Ons Algebra: The Foundations of Being and Time; See also Ons Algebra: The Emergence of Quaternionic, Octonionic and Clifford Algebra Structure From Laws of Multiboundary Form with Tony Smith, Onar Aam and Kent Palmer at http://goertzel.org/ben/ben_research.html

Annihilation mosaics can form cycles, and these cycles have the form of Emergent Meta-systems. The basic idea here is that Emergent Meta-systems do not assume continuity from one cycle to the next, but each cycle springs from the void spontaneously and unfolds in a series of steps until it returns to the void. This is very similar to the ideas put forth by Kauffman in The Origin of Order⁸⁴ or At Home in the Universe⁸⁵ where spontaneous organization is seen as the basis on which evolution occurs. The difference is that Emergent Meta-systems assumes radical discontinuity rather than continuity between cycles. It is thus an image of Existence rather than Being.

The emergent meta-system is the most fascinating aspect of Holonomics because it combines the normal systems with the special systems to produce the next major emergent level of the meta-system. In other words, the various kinds of conjunction systems unfold from each other in a series that takes us from system to meta-system and back again. This cascade is seen as a natural aspect of the void or emptiness itself beneath the projection of Being onto existence. Existence is described by the realm of pure discontinuity under the assumed continuity of Being. What is interesting is that Being itself is not unified and, in fact, is broken up into fragments that are the interfaces between the special systems.

<u>Kinds of Being</u>	<u>Emergent Systemic Levels</u>
	System = thermodynamic-living-social gestalt
Pure Being	
	Holonic Dissipative Special System = Thermodynamic
Process Being	
	Holonic Autopoietic Special System = Living
Hyper Being	
	Holonic Reflexive Special System = Social
Wild Being	
	Meta-system (EMS)

Pure Being is the normal way we think about the concept of Being which has been prevalent in our philosophical tradition up until the last century. In the last century, Continental philosophy has discovered other kinds of Being. The first of these was Process Being which is dynamic and Heraclitian rather than Parmedian and static like normal undifferentiated Being. Derrida is the foremost promoter of looking at things in terms of Hyper Being which he calls *Differance*, i.e. differing and deferring. Merleau-Ponty calls this Hyper Being and contrasts it with Wild Being in his book The Visible and the Invisible. We will not give a further elaboration of the kinds of Being here except to note that they are the interfaces between the different kinds of systems and that this allows their properties to be very precisely defined. The Emergent Meta-system can then be seen as an unfolding through the series of the kinds of Being in a series of emergent steps. The kinds of Being together define Emergent phenomena within the world in

⁸⁴ Kauffman, Stuart A. The Origins of Order: self-organization and selection in evolution. New York : Oxford University Press, 1993.

⁸⁵ Kauffman, Stuart A. At Home in the Universe: the search for laws of self-organization and complexity. New York : Oxford University Press, 1995.

general so there is an interesting relation between these two ways of looking at this unfolding from the system to the meta -system or vice versa. This leads us to postulate a general theory of Worlds based on this theoretical foundation.

GENERAL WORLDS THEORY

We postulate not only these few schemas, but a whole series of schemas that describe an ontological series of emergent levels in contrast to the ontic series we normally hear about in systems theory. The ontic series goes from the quark up to social phenomena through a series of emergent steps we find in the world as phenomenal discontinuities between emergent levels which could not be reduced away by reductionist analytical efforts. Contrasted to this, we see a series of schemas which are ontological in nature that describe our various templates of understanding that we project on the ontic phenomena found in the world. The ontological series of schemas is something like this:

Pluriverse = Parts with no whole
Kosmos
World
Domain
Archon (meta-system)
System
Form
Pattern
Monad
Facet = Whole with no parts

This series of ontological schemas moves from the lowest level where we find wholes that do not seem to have any parts, like quarks, to the highest level where we have parts but cannot see any whole, like the pluriverse of multiple simultaneous universes such as those postulated by David Deutsch in The Fabric of Reality. Each of these levels are holonomic in the sense that each is merely a conjunction of those on either side which has particular properties that look both ways simultaneously, i.e. up the hierarchy and down the hierarchy. This hierarchy is merely the set of schemas that we project on what Cornelius Castoriadis calls the Magma of existence, i.e. that which oozes beneath our categorical projections on the phenomena of the world. Each of these ontological emergent levels has characteristics of its own, making it very different from the others yet interrelated with them in a strange way through holonomic conjunction. What Onar Aam has pointed out, is that the holon is made up of something that is simultaneously part and whole, and that the ends of the series are either whole without part or part without whole, and the holon, in each case, is both of these together. We can think about sliding⁸⁶ the reference end points up and down the scale so that each adjacent schema can be thought of as a whole without parts or a part without wholeness instead of a holon. Onar Aam points out that the opposite of the holon is the holoidal hologram formation. The hologram is neither part nor whole because it contains partial images of all the parts and

⁸⁶ Bob Cummings had this insight.

partial images of the whole from multiple perspectives without actually containing the whole or the part or both. We can think of the Holoidal formation of the hologram as the opposite of the undifferentiated magma of the ontic. Thus, we have two opposite extreme ways of looking at the ontic. We can see it as magma, always eluding our categorical projections, or we can think of it as holoidal such that it is never either part or whole and thus like a hologram that contains partial parts and partial wholes from various perspectives without resolution to something determinate. We can think of these as two different ways of looking at things by the conjunction of the aspects of Being. The holoidal is a conjunction of truth, reality, identity and presence which is opposite the ephemeron which is the counter projection of falsehood, illusion, difference and absence. All the possible combinations of the four aspects and their opposites give us a rich field of the possible facets of Being. When we note that each of these combinations may occur at various meta-levels of Being which we saw above, then we begin to get a picture of just how complex our worldview might be.

The General Theory of Worlds would embrace all of these possibilities and attempt to comprehend how the various schematic levels interrelate. We call it a theory of worlds because it would focus on how the kinds of Being and the aspects of Being would cohere into a single picture of the world out of the fragments of the various facets of Being. There are sixteen permutations of the facets and four levels of Being which gives a veritable I Ching⁸⁷ of 64 possible facets of the world with respect to Being. The relation between Normal Systems and Special Systems through the Emergent Meta-system that produces Archons (meta-systems proper) is an important part of this study of the nature of the world because the ontological hierarchy itself is holonomic, i.e. ordered through conjunction and phase shifted to produce an imaginary space which is partially a field, and partially the elements within a field.

This theory must also deal with two other hierarchies which are the individual and social emergent hierarchies by which information is processed within the world:

Absolute
actualization
Existence
insight
Ontos
wisdom
Episteme
knowledge
Paradigm
information
Theory
data
Facticity
given
Suchness

⁸⁷ R. Wilhelm & C.F. Baynes. I Ching or Book of Changes. Pantheon 1950.

The italicized levels relate to the information processing of the individual, and the normal font relates to the information processing of the social group. There is a dialectic between the individual and the social group in the projection of the gestalt (i.e. system) or the other schemas. The social construction or invention of the world takes place in the relations between these four hierarchies. If we see our world split between *physis* and *logos*, and that there is a lower level splitting between limited and unlimited, then we see that the ontic concerns the *physis* and the ontological concerns the *logos* and that these two later hierarchies concern the relation between the limited as suchness and the unlimited as absolute.

The theory of worlds looks at the way that the schemas in general are applied to the phenomena. For instance, the ontic hierarchy must withstand the pressure of reductionism, and the emergent ontic levels stand as whatever cannot be reduced. On the other hand, the ontological hierarchy must withstand the pressure of skepticism and what survives are the schemas that do not collapse under that pressure. When we look at the Social/Individual hierarchy, we see that it must withstand the pressure of nihilism and that it is about the social and individual dialogue of the real distinctions in the world that attempt to make a non-nihilistic distinction. Out of the theory of worlds arises the set of schemas that we will attempt to apply in order to understand phenomena and to incorporate as a basis for theory building concerning natural phenomena. Some of these schemas will be combined, as we have seen that of System Form and Pattern combined, to produce the Formal Structural Systems Theory. We have suggested another combination in the Emergent Meta-system of the Archon, Holon and System as a viable set of schemas from the set of ontologically acceptable schemas in order to understand certain anomalous phenomena which augment and take to a new level what was achieved through the projection of the Formal Structural System based on Form, Pattern and System schemas by various disciplines of science.

The Theory of Worlds concentrates on the level of the schema of the world and attempts to bring together ways of looking at things via the aspects and kinds of Being with the insights afforded us by the relations between Special Systems and normal Systems to build Meta-systemic Archons via the Emergent Meta-system cycle which represents a model of Existence. Thus, the Theory of Worlds looks at the relation between existence and ontology at the level of the world schema and considers the nesting of systems in meta-systems via the holonic intermediaries. It would also consider the relation of wholes that cannot be parts and parts that cannot be wholes to holons and holoidal hologram-like formations while also considering the sliding scale by which these are applied to the various holonic ontological levels.

CONCLUSION

What has been outlined here is a new way of looking at General Systems Theory as only one out of many General Schemas that might be applied to the phenomena that we encounter in the world. Formal Structural Systems Theory is well developed and is the basis of science in many disciplines. We suggest here that there is a new set of schemas

that we need to explore together which includes the System, Holons, and Meta -systems as well as Worlds. Together, Systems and Holons produce Meta -systems through the Emergent Meta -system cycle. This cycle points up the relation between the various emergent levels which, in turn, define the fragmented kinds of Being. The kinds of Being are defined in terms of modes of being -in-the-world so that there is this interesting connection between the differences between the special systems and the differentiation of the world. Thus, the relation between Being and Existence on the one hand, and the schema of the world on the other hand, are implicated in our understanding of the special systems and their place between systems and meta -systems. So it is necessary to posit a general Theory of Worlds which subsumes the theory of Holons and Meta -systemic Archons into a coherent and integrated picture.

If we allow the incorporation of other schemas besides the *System* schema in our ways of looking at the world, then our understanding of phenomena will be much richer. The problem is always the reduction to a single schema. This proved wrong when there was exclusive focus on the *Form* schema. It will equally be a mistake if we try to reduce everything to *Systems* and do not recognize the existence of other schemas like that of *Holons*, *Meta-systems* and *Worlds* as viable templates of understanding for projection on ontic phenomena as a basis of understanding it better.

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Kent Palmer is a Principle Systems Engineer at a major Aerospace Systems Company. He has a Ph.D. in Sociology concentrating on Philosophy of Science from the London School of Economics and a B.Sc. in Sociology from the University of Kansas. His dissertation on The Structure of Theoretical Systems in Relation to Emergence⁸⁸ focused on how new things come into existence within the Western Philosophical and Scientific worldview. He has written extensively on the roots of the Western Worldview in his electronic book The Fragmentation of Being and the Path Beyond the Void⁸⁹. He had at least seventeen years experience⁹⁰ in Software Engineering and Systems Engineering disciplines at major aerospace companies based in Orange County CA. He served several years as the chairman of a Software Engineering Process Group and is now engaged in Systems Engineering Process improvement based on EIA 731 and CMMI. He has presented a tutorial on “Advanced Process Architectures⁹¹” which concerned engineering wide process improvement including both software and systems engineering. Besides process experience, he has recently been a software team lead on a Satellite Payload

⁸⁸ <http://server.snni.com:80/~palmer/disab.html> You may also try <http://dialog.net:85/homepage/> or <http://think.net/homepage/> for any of the web related material.

⁸⁹ <http://server.snni.com:80/~palmer/fbpath.htm>

⁹⁰ <http://server.snni.com:80/~palmer/resume.html>

⁹¹ <http://server.snni.com:80/~palmer/advanced.htm>

project and a systems engineer on a Satellite Ground System project. He has also engaged in independent research in Systems Theory which has resulted in a book of working papers called Reflexive Autopoietic Systems Theory⁹². A new introduction to this work now exists called Reflexive Autopoietic Dissipative Special Systems Theory⁹³. He has given a tutorial⁹⁴ on “Meta-systems Engineering” to the INCOSE Principles working group. He has written a series on Software Engineering Foundations which are contained in the book Wild Software Meta -systems⁹⁵. He now teaches a course in “Software Requirements and Design Methodologies” at the University California Irvine Extension. He may be reached at palmer@think.net.

⁹² <http://server.snni.com:80/~palmer/refauto2.htm>

⁹³ <http://server.snni.com:80/~palmer/autopoiesis.html>

⁹⁴ <http://dialog.net:85/homepage/incosewg/index.htm>

⁹⁵ <http://server.snni.com:80/~palmer/wsms.htm>

SIG: Duality Theory

ABSTRACT

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INTERTWINING OF DUALITY AND NONDUALITY

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Special Systems Theory and the theory of Emergent Meta -systems are articulated in a previous paper on *Reflexive Autopoietic Dissipative Special Systems Theory*⁹⁶. This theory recognizes the profound relation between Duality and Nonduality. Nonduality is an oriental philosophical concept explained by David Loy in his book *Nonduality*⁹⁷. Basically nonduality is a middle ground between unity and duality. It is not one and not two. Nonduality is the holonomic middle ground between unity and duality. Special Systems theory shows that there is a middle ground of this kind between the duals of System (whole greater than the sum of its parts) and the Meta -system (whole less than the sum of its parts, eg. environment or ecosystem). This nonduality expresses itself as three special holonic systems called Dissipative, Autopoietic and Reflexive. These special systems are defined by hyper -complex algebras and have physical phenomena that express their structure which shows that these are real possibilities within the natural world. Special systems are ultra -efficacious (ultra-efficient and ultra-effective) in relation to normal open or closed systems. Thus, they are rare anomalies. But when they appear, they take over and spread to all possible niches in the environment as life did on earth. Dissipative special systems are neg-entropic. Autopoietic special systems are the systems theoretic template for life. Reflexive special systems are the template for social relations among living things. Each of these special systems are holonomic, i.e. have properties like those that Arthur Koestler attributed to Janus faced holons. Holons are chiasmic and reversible non-duals that stand in the middle ground between duals. The Emergent Meta -system is a special kind of holonic formation that combines the three special systems with a normal system. It is a dynamic structure similar to a genetic algorithm by which a model of the meta -system is produced out of the interaction of the special systems. (Duality Theory. Special Integration Group)

⁹⁶ This paper may be found at <http://server.snni.com:80~palmer/autopoiesis.html>

⁹⁷ Loy, David, *Nonduality*: a study in comparative philosophy. New Haven : Yale University Press, c1988.

Intertwining of Duality and Nonduality

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SUMMARY

Special Systems Theory and the theory of Emergent Meta-systems are articulated in my previous paper *Reflexive Autopoietic Dissipative Special Systems Theory*⁹⁸. This theory recognizes the profound relation between Duality and Nonduality. Nonduality is an oriental philosophical concept explained by David Loy in his book *Nonduality*⁹⁹. Basically, nonduality is a middle ground between unity and duality. It is not one and it is not two. Nonduality is the holonomic middle ground between unity and duality. Special Systems theory shows that there is a middle ground of this kind between the duals of a System (a whole greater than the sum of its parts) and the Meta-system (a whole less than the sum of its parts, e.g. environment or ecosystem). This nonduality expresses itself as three special holonic systems called Dissipative, Autopoietic and Reflexive. These special systems are defined by hyper-complex algebras and have physical phenomena that express their structure which shows that these are real possibilities within the natural world. Special systems are ultra-efficacious (ultra-efficient and ultra-effective) in relation to normal open or closed systems. Thus, they are rare anomalies. But when they appear, they take over and spread to all possible niches in the environment just as life did on earth. Dissipative special systems are negative-entropic. Autopoietic special systems are the systems theoretic template for life. Reflexive special systems are the template for social relations among living things. Each of these special systems are holonomic, i.e. they have properties like those that Arthur Koestler attributed to Janus faced holons. Holons are chiasmic and reversible non-duals that stand in the middle ground between duals. The Emergent Meta-system is a special kind of holonic formation that combines the three special systems with a normal system. It is a dynamic structure similar to a genetic algorithm by which a model of the meta-system is produced out of the interaction of the special systems. The meta-systems are distinguished from super-systems which are nested levels of systems. A meta-system is a deconstructed super-system and appears as a field out of which systems arise and through which they interoperate and cooperate. A meta-system is an environment or ecosystem for a certain level of system and anti-system pair. It is out of this milieu that holonic non-dual structures arise in anomalous and rare instances. The meta-systemic structures are a prototype for Gaia in which multiple species engage in Emergent Meta-system dynamics in relation to each other in a broader environment and thus create and regulate the cooperatively created environment that they share with other species.¹⁰⁰

⁹⁸ This paper may be found at <http://server.snni.com:80/~palmer/autopoiesis.html>

⁹⁹ Loy, David, *Nonduality*: a study in comparative philosophy. New Haven : Yale University Press, c1988.

¹⁰⁰ See also the following papers presented at ISSS2000: *Defining Life And The Living Ontologically And Holonomically in the What is Life and Living?* SIG; and *New General Schemas Theory: Systems, Holons,*

Keywords Life Ontology, Holonomics, Holon, Meta-System, Special System, Nonduality, Dualism, Complementarity

INTRODUCTION

Duality has to be balanced with Nonduality as a way of looking at phenomena. David Loy, in his book called Nonduality, has explained the basic principles of this way of looking at things that is more prevalent in the Orient than in the Occident. The great challenge that we have in Western Philosophy, Science, and Systems Theory as well is to attempt to understand this way of looking at things within the context of our own viewpoint on phenomena which has been successfully developed in a dualistic scheme. We must be aware that there are two completely different uses of the terms "Dualism" or "Duality." One is mathematically based and has to do with the reversal of certain features in order to produce an isomorphism between two structures that are opposite each other. The other use is more philosophical and has to do with the production of nihilistic artificial and extreme opposites which come into conflict and where one subdues the other as in the case with the Mind/Body dualism. When we use the terms "dualistic" or "dualism," we are generally talking about the philosophical variety of dualism. When we talk about "duality" or two things being duals of each other, we are using the mathematical concept. This later use of the term would be better stated in terms of complementarity rather than duality. It is important to our discourse not to mix up these two uses of the same word. Here when we speak of Duality, we mean mathematical isomorphism between the features of two opposites, i.e. complementarity. It can be contrast to unified objects which are seen to be self-dual, i.e. the reversal of characteristics maintains the same structure. Non-dual has the specific meaning of not one and not two, which is to say that there is an intermediary or middle path between unity and duality. Many times these mathematical isomorphisms are seen as the basis for producing philosophical concepts which are opposites, or even extreme artificial and nihilistic opposites, which then come into conflict in which one dominates the other. This use of the term is a super-structure built over the mathematical use of the term duality and produces a dualism in which dialectically opposite dualistic philosophical arguments or positions are built. Much of that construction assumes, as Kant did, that antinomic opposite positions that are mutually contradictory is the only way to produce arguments by Reason, and that these arguments may never defeat each other ultimately because they are based on opposite assumptions. Thus, throughout the history of the Western tradition dualism uses duality as part of the armament by which it builds up dialectically opposite arguments and philosophical positions which spar with each other. In the Orient, thought took a very different direction thought, which we find difficult to appreciate, in which a middle alternative between dualism and dogmatic monism has been found, and this is a direction that the Western Tradition has found difficult to appreciate.

NONDUALITY

Meta-Systems & Worlds in the Research Toward a General Theory of Systems SIG. References are given in the first paper where the reference is mentioned.

In order to understand this, we must go back to Aristotle and his principle of the Excluded Middle which he held as the first principle in his metaphysics. By excluding the middle and banning contradiction, Aristotle forces our tradition down the road of Dualism where one of the antinomic opposites constructed by reason must completely dominate the other in order to build a dogmatic monism. It is this move that we must undo in order to appreciate how the non-dual is possible as an alternative to duality and how it causes us to undermine dualism within our tradition. If we allow the middle between two opposites, then we open up the possibility of considering both A and ~A, as well as neither A nor ~A, as well as the opposites themselves. This broader logic was developed in India, and it is precisely this that Aristotle seems to find so disturbing. When we allow the *both...and* as well as the *neither...nor*, then it is possible to follow Nagarjuna's reasoning which posits that the difference between these excluded possibilities is unthinkable. That unthinkable he calls *sunyata* or *emptiness*. It is this emptiness that is the essence of the non-dual. What we need to do in our tradition is to attempt to come to terms with the existence of this possibility. We can do that by looking a little closer at our own concept of Being.

Being is not a conceptual monolith, but as recent Continental Philosophy has discovered, it is fragmented into a series of modes of being-in-the-world. These various modes of being-in-the-world reveal various kinds of Being which are called Pure Being, Process Being, Hyper Being and Wild Being. They form a staircase of meta-levels of Being. This staircase does not go anywhere because the fifth meta-level is missing. When we try to think it, we fail; we cannot conceive it. It is unthinkable just like the difference between the both...and and the neither...nor. Both of these are ways to access existence. Existence is itself intrinsically empty, and we run directly into it when we try to move up through the meta-levels of Being. We can call the fifth meta-level ultra-Being because it moves beyond Being itself into Existence.¹⁰¹

It is at the level of Pure Being that all Dualities exist. An example is Subject/Object dichotomy, or mind/body, or consciousness/unconsciousness. Pick any extreme artificial and nihilistic opposites and they will have their Being at the level of Pure Being. Pure Being is static and rigid, even frozen, being identified with Parmenides' view of the world. It assumes that things are determinate and continuous and is, in fact, an illusion. When we move up to the next meta-level of Being, we find that we move back prior to the arising of the extreme duals to the process of their projection. This is the level that Heidegger identifies with Dasein. It is probabilistic and dynamic, being identified with Heraclitus' vision of the world in flux. At this level, we see that there is dynamic interchange between the extreme, artificial and nihilistic opposites in as much as they serve to create each other and keep each other in existence despite their seeming conflict. Sartre called this the detotalized totality in his Critique of Dialectical Reason. When we move up to the next level of Being, we discover Hyper Being which Derrida calls difference, i.e. differing and deferring. Heidegger called it ~~Being~~ (crossed out) and

¹⁰¹ Sankara's Advaita Vedanta, which is another non-dual philosophy, interprets Existence as a kind of Being in this way. We prefer to follow Nagarjuna who recognized that Being ends at the fourth meta-level. Whatever is at the fifth meta-level or beyond is maya or illusion.

Merleau-Ponty called it the dialectic between Process Being of Heidegger and the Nothingness of Sartre. Levinas says that this is the level where metaphysics and ethics collapse into each other. It is a realm of undecidability such as that noticed by Godel. At that level, there is not just exchange between the nihilistic opposites, but there is a hinge between them which is undecidable. Finally, we move to the level of Wild Being. Merleau-Ponty named this level of Being in The Visible and the Invisible. He also called it Flesh and pointed to the incommensurability of touch touching. In touch touching, there is a chiasm or reversibility which means that there is a difference from one way of approaching the matter at hand, as it is seen, from another way of approaching the same matter. So *thoughtfeeling* is different in meaning from *feelingthought*. This subtle difference in meaning points up an area of nonduality in the cusp between the two reversed combinations. What exists within this cusp between the reversibilities, like the reversibility between the two phases of a spacetime interval, is pure nonduality. Pure nonduality is beyond Being altogether. All of the world has nonduality embedded in it beyond all the dualisms that we project upon the world. Thus, the thinkability of the world that comes with Being has a hidden unthinkability of existence embedded in it. Zen Buddhism attempts to expose the supra-rationality of this core of unthinkability.

We start with the assumption of continuity and determinism that we project on everything. Slowly this is deconstructed as we move down the levels of Being until it completely falls apart at the threshold of Existence, i.e. the fifth meta-level of Being. On the other hand, Oriental philosophies for the most part start with Existence which is the complementary dual of Being. The build up of illusion as continuity projected by Being attempts to cover over the fundamental discontinuities in existence. The kinds of philosophies that Loy describes begin with the assumption of discontinuity, which is only natural for languages without Being as an integral part. The concept of Being is built into the Indo-European languages. The doctrine of Buddhism is an anomaly. It is an example of the discovery of the fundamental nonduality of existence within an Indo-European culture despite the assumption of Being as a linguistic given.

Aristotle's concept of the Excluded Middle and Non-contradictoriness covers over the comprehension of what is called Supra-rationality, which is the opposite of paradoxicality. Paradoxicality is generated with, we assume, the excluded middle. But despite this, contradiction is allowed. In paradoxicality, contradictory concepts conflict and interfere with each other within our thought processes. Supra-rationality is something entirely different from this. It occurs where two opposites are allowed to exist at the same time and place without interference. This can only be seen when we drop the principle of the excluded middle altogether, and look at the way that the opposites interlock across different modes so that the two opposites can exist in their different modes at the same time without interfering. Interestingly, Jainism took this to be the fundamental way that the world works, and their argumentation attempted to clarify how it was always the case that opposites were simultaneously true. Buddhists, on the other hand, also saw existence in terms of supra-rationality but tended to be more idealistic than the Jainists who accepted that the material world was an opposite that existed simultaneously with consciousness. Buddhism, instead, followed most of Hinduism and discounted the importance of the material world. This is why Buddhism and Taoism ended up being

complementary opposite paths. Of course, our culture has gone to the opposite extreme, embracing materialism and discounting, for the most part, consciousness while at the same time supporting basically idealistic philosophies. Thus, in our society and culture, we have a contradiction between our materialistic techno-science and our philosophical tendencies which lean toward idealism. This dualism is driven by the kinds of contradictions that Hegel and Marx pointed out. These contradictions underlie the dynamics of our culture producing an historical dynamism or an economic determinism, however one prefers to look at it.

On the other hand, if we accept the possibility of the supra-rational as the opposite of the paradoxical, then we will be able to understand nonduality. Nonduality is always supra-rational; this is a positive way of expressing the unthinkability of it. *The supra-rational is not irrational. That is to say, it is not a breakdown of reasoning but a transcendence of it. Reasoning is merely the production of arguments that attempts to establish motive or cause.* Irrational action or argument fails to establish reason or cause at all. Supra-rational argument is always based on silence. The Buddha was silent when asked about antinominal metaphysical opposites. This is a real meta-physical position which shelters itself in silence, similar to the kind of sheltering that Sextus Empiricus¹⁰² attempts when he tries to keep the dialectic going but also tries not to get caught up in it. The unthinkability of Existence is supra-rational, and because of that, it ends up bringing us to silence. If we are silent, the world does not vanish. So this is a real philosophical position based on the meta-physics of existence which appears as a viable alternative when we stop the projections of Being. After much silence, a few words may contain immense meaning when compared to endless chatter which is meaningless.

A TOPOLOGICAL ANALOGY

But how should we understand this duality between the Supra-rational and the Paradoxical? We are fortunate that there is an analogy in Mathematical Topology that will help us. That is the analogy of the series of non-orientable surfaces which has previously been explored by Steven Rosen¹⁰³. We posit that the series of non-orientable surfaces called mobius strip, kleinian bottle and hyper-kleinian bottle¹⁰⁴ give us an excellent lesson in the way that duality and nonduality intertwine emergently. We start off with the two-edged and two-sided lemniscate which, when joined together with another intertwined oppositely twisted lemniscate, gives you a one-sided and one-edged mobius strip. Then, when we take two oppositely twisted mobius strips and glue them along the edges, we obtain the kleinian bottle. Two kleinian bottles glued along their circles of interference, give you a hyper-kleinian bottle. When we look at the mobius strip, what we notice is that it is locally dual and globally non-dual. It seems to have two edges and two sides, but, in fact, only has one edge and one side when viewed globally.

¹⁰² Sextus Empiricus. Outlines of Scepticism. Translated by Julia Annas and Jonathan Barnes. Cambridge [England] ; New York : Cambridge University Press, 1994.

¹⁰³ See "Wholeness as the Body of Paradox" at <http://focusing.org/Rosen.html>

¹⁰⁴ A hyper-kleinian bottle joins two bitoridal kleinian bottles along their circles of self-intersection. In other words where a toridal kleinian bottle has a figure eight cross section, a hyperkleinian bottle has a four leaf clover cross section.

The same is true of the kleinian bottle which appears to have inside and outside surfaces locally, but, in fact, has only one surface. Similarly, in the hyper-kleinian bottle, the joined circles of self-interference creates an ambiguity as to which kleinian bottle we are in at the circle of mutual self-interference.

As Steve Rosen¹⁰⁵ points out, these figures teach us that it is necessary to have both duality and nonduality at the same time. In the mobius strip, it is a difference of local versus global perspectives that separate the distinction between two surfaces or edges from only having one surface and one side. The same is true of the kleinian bottle which makes the inside and outside similarly problematic as we switch from local to global perspectives. In the hyper-kleinian bottle, it is the self-other dichotomy that becomes ambiguous locally but globally unambiguous. Duality and nonduality always appear together as two sides of the same coin. Thus, Being and Existence, as the assumption of continuity and discontinuity, must always appear together. When we read this larger meta-physical context into what we learn from topology, we find that we can identify the lemniscate with the supra-rational and the ambiguity of the hyper-kleinian bottle's interlocked circles of self-intersection with paradoxicality. The lemniscate is dual, that is to say it really is two edged and two sided, both locally and globally, and we create it when we cut a mobius strip down the middle lengthwise. In the lemniscate, we suddenly break into an emergent level where the two opposites can be distinguished and nonduality vanishes. We get instead two interlocked lemniscates. We take this as the sign of the non-nihilistic naturalistic and non-extreme distinction between the two opposites that are supra-rationally interlocked. As soon as we sew them together, we get the mobius strip which has the non-orientability that signifies their nonduality which at the same time shows us their duality. As we proceed through the emergent levels, we eventually produce the paradoxicality of the hyper-kleinian bottle where we can no longer tell self from other, the opposites are mixed and contradictory rather than separated and distinctly defined while at the same time having a non-dual relation to each other.

Nonduality and duality are two ways of looking at the same non-orientable figure. Nonduality, when it breaks free from Being, produces non-nihilistic natural and non-extreme interlocked opposites. But as it moves up into Being, the mixture of the dual and non-dual increases in intensity until they become paradoxical mixture which is contradictory and chaotic. Being is ultimately a paradox, even an absurdity, i.e. meta-paradoxical. In order to try to come to terms with it in reason, we break it down using Russell & Copi's¹⁰⁶ higher logical type theory. We produce the meta-levels of Being as a hierarchy to diffuse the mixture of paradox and viciousness of the circles within Being, and then at each level, we produce the various aspects of Being, i.e. truth, reality, identity, presence. Each aspect of Being has a different character at the various meta-levels of Being. This gives us sixteen facets of Being that is like a mobile which intersects with itself just prior to collapse into paradoxicality. Reason is the attempt to use all four aspects of Being together at a particular level of Being, i.e. Pure, Process, Hyper, Wild, or Ultra. Ultra is the fifth meta-level of Being which is really beyond Being and is

¹⁰⁵ Rosen, S. M. *Science, paradox, and the Moebius principle*. Albany: State University of New York Press. 1994.

¹⁰⁶ Copi, Irving M. *The Theory of Logical Types* London, Routledge and K. Paul, 1971.

actually existence proper, which we experience as pure nonduality though a supra-rational grasping by the heart rather than the mind. In most Oriental philosophies, there is no distinction made between heart and mind. The supra-rational cannot be understood by the mind but can be understood by the heart which has reasons that reason itself cannot comprehend. This level that transcends the Ego and its Shadow is what Jung calls the Self, which is a totality rather than a unity.

ONTOLOGICAL DUALISM AND NONDUALITY

This topological analogy lends support for our understanding of the relation between duality and nonduality which is intimate and interwoven. We see the interwoven nature of the two when we see that the meta-levels of Being are distinguished by the various holons that exist between the System and the Meta-system. A system is a social gestalt that is a whole greater than the sum of its parts. A meta-system is a social proto-gestalt that is a whole less than the sum of its parts. A proto-gestalt is the background for a gestalt which has what David Bohm calls implicate order. A meta-system is a field, environment, ecosystem, ecology, situation or context. It is the opposite of the super-system which is a nesting of systems within systems within systems. The meta-system takes apart the super-system to reveal the systems that are parts within it. It turns out that between the System as a surplus and the Meta-system as a lack, there is a series of non-dual holons which form a series of intermediate emergent levels between the system and the field of its origin/arena. These holons, which as Koestler says in Janus, are both parts and wholes at the same time. They are called dissipative special systems, autopoietic special systems, and reflexive special systems. These special systems are partial systems and partial meta-systems at the same time, i.e. non-systems and non-meta-systems simultaneously and are supra-rational. They are wholes, like perfect numbers, which are exactly equal to the sum of their parts. In fact, an analogy for the dissipative special system is the amicable numbers which are two numbers that perfect each other. An analogy for the reflexive system is the sociable numbers which are a set of numbers that perfect each other in a ring. In these analogies, the perfect number is the image of the autopoietic special system which is the static balance between the dissipative and reflexive special systems. Dissipative special systems exemplify a lack, and reflexive special systems exemplify a surplus in relation to the autopoietic special system which has perfect balance. Together the Reflexive and Dissipative special systems compensate each other so that they represent a perfect dynamic balance in their duality which is the dual of the balance of the Autopoietic special system. Beyond these analogies, we can see that the special systems have their basis in the Hyper Complex Algebras. Where the system is analogous to the real algebra, the dissipative special system is analogous to the imaginary algebra that introduces conjunction. The autopoietic special system is analogous to the quaternion algebra that loses the commutative property, the reflexive social special system is analogous to the octonion algebra that loses the associative property, and finally the meta-system is analogous to the sedenion and higher hypercomplex algebras which lose the division property. All of the special systems are non-dual and are thus a model of existence, but the differences between them are defined by the kinds of Being, so that existence is intertwined intimately with the definition of the kinds of Being and vice versa.

<u>Kinds of Being</u>	<u>Emergent Systemic Levels</u>
	System = thermodynamic-living-social gestalt
Pure Being	
	Holonic Dissipative Special System = Thermodynamic
Process Being	
	Holonic Autopoietic Special System = Living
Hyper Being	
	Holonic Reflexive Special System = Social
Wild Being	
	Meta-system

This intertwining of duality and nonduality is precisely analogous to the kind of intertwining we saw in the mobius strip and kleinian bottle. Each one defines the other in a way that, is like an Escher print of two hands coming out of the paper to draw each other. Duality and nonduality, and thus Being and Existence, mutually define each other and are symbiotic to each other. Together, they are, in fact, an image of the autopoietic symbiotic special system's static balance between system and meta -system, or as Bataille in Accursed Share would say, between the restricted and *general* economies. The dissipative ordering special system and the reflexive social special system together form a dynamic balance which is the dual of that static balance of the self -dual autopoietic system. Reflexive systems are made up of four conjuncted Dissipative special systems whereas the autopoietic system is made up of two. This repeats the motif of surplus and deficit seen in the comparison of the system with the meta -system where the reflexive special system is overflowing and the dissipative special system, being not enough, is underflowing so composition is necessary to produce static symbiotic balance. The topological series has similar properties as the series based on algebras:

Meta-system (sedenion algebra)	Lemniscate
Reflexive Special System (octonion algebra)	Mobius Strip
Autopoietic Special System (quaternion algebra)	Kleinian Bottle
Dissipative Special System (imaginary algebra)	Hyper-Kleinian Bottle
System (real algebra)	Hypersphere of ambiguity ¹⁰⁷

The difference is that we must reverse the order of our identification of the lemniscate and the meta -system with nonduality, existence, non -nihilism, etc. The hypersphere of ambiguity is produced from the relation of the two circles of self -interference of the two kleinian bottles that compose the hyper -kleinian bottle as seen in four dimensional space. If the system is seen as having Being, then it is engulfed with the paradoxicality of Being like that which appears in the self-other paradoxicality of the hyper-kleinian bottle. As we

¹⁰⁷ This hypersphere is formed from the two independent circles of self-intersection of the two kleinian bottles that are joined to form the hyper-kleinian bottle as seen in four dimensional space.

unzip the two kleinian bottles that make up the hyper-kleinian, then we get the individual kleinian bottles that have the nonduality of inside and outside. When we unzip these, we get the separate mobius strips that have the nonduality of their two sides and two edges. When we unzip the mobius strips, we get the lemniscates which are interlocking duals, i.e. which makes a natural dualistic distinction which holds and is not negated by a global perspective. *A hyper-kleinian bottle is made up of four mobius strips or two kleinian bottles just like the reflexive special system is made up of four dissipative special systems or two autopoietic systems.* We can see the same kind of organization in solitons which form breathers, and we might suppose instanton super-breathers¹⁰⁸ by a conjunction operation. There are several different physical and mathematical holonic hierarchies (holarchies) with this kind of structure which show us the nature of the Special Systems as embodiments of nonduality embedded in duality. We need to study these mathematical and physical structures which give us a deeper understanding of holonic construction, like the Cooper pairs of superconductivity¹⁰⁹. It is by searching out the holonomic anomalies in mathematics and in physical phenomena that we will be able to understand these non-dual structures and be able to find other examples in different disciplines. But our way will be hindered as long as we subscribe to the excluded middle as the basic metaphysical principle. We need to allow the non-dual realm of existence to show itself beyond our projections of illusory continuity through ideation. It is this illusory continuity, for instance, that attempts to establish the Copenhagen convention¹¹⁰ that the quantum mechanical phenomena only occurs on the microscale. *Instead, the non-dual approach establishes the possibility of macro-quantum mechanical phenomena which is suppressed by our worldview through the projection of Being on existence.* The model that David Deutsch proposes in The Fabric of Reality¹¹¹ is much closer to our understanding of the nature of existence. But rather than seeing simultaneous physically real universes that are somehow isolated from each other, except for the interference at the quantum mechanical level, we see that the pluriverses are interpenetrating, and that the nature of this interpenetration as seen by the mind is emptiness, or sunyata, and thus is supra-rational. At the other end of the spectrum are the multiple worlds found by David Chalmers when he considers consciousness. This multiplication of worlds is because each of us may apprehend qualia differently. This multiplication of qualitative worlds has a similar nature to the suppression of multiple quantum worlds by the Copenhagen convention. We, instead, take the multiple quantal physical worlds and intersect them with the multiple qualitative worlds to obtain what might be called a Macro Quantum - Qualia Observer Mechanics, which celebrates the inundation of the pluriverse of

¹⁰⁸ In physics called multi-Monopoles. See Duality and Supersymmetric Theories edited by David I. Olive and Peter C. West. Cambridge, U.K. : Cambridge University Press, 1999.

¹⁰⁹ Bardeen, John, Understanding Superconductivity. Philadelphia, American Society for Testing and Materials, 1964. Billings, Charlene W. Superconductivity : from discovery to breakthrough. New York : Cobblehill Books/Dutton, c1991. Blatt, John Markus. Theory of Superconductivity. New York, Academic Press, 1964. Bogoliubov, N. N.. The Theory of Superconductivity. New York, Gordon and Breach, 1968, c1962. Crisan, M.. Theory of Superconductivity. Singapore ; Teaneck, N.J. : World Scientific, c1989.

¹¹⁰ Wick, David, The Infamous Boundary : seven decades of controversy in quantum physics. With a mathematical appendix by William Farris. Boston : Birkhauser, 1995.

¹¹¹ Deutsch, David, The Fabric of Reality: the science of parallel universes- and its implications. New York : Allen Lane, c1997.

existence into our lives instead of attempting to suppress it by our projection of illusory continuity through Being.

A GENERAL THEORY OF SCHEMAS

Within this supra-rational world in which the Copenhagen and the Cognitive conventions are eluded, there is a continual production of complementarities within tiers of the meta - system which brings out the significance of duality for our understanding of the world. Complementary opposites are everywhere in the meta -system, even complementarities of complementarities with arbitrary levels of nesting, which are suppressed by a focus exclusively on the system as a schema for understanding phenomena. When we begin with this in mind, rather than attempting to construct it or invent it in spite of the dualisms of our culture, then we get a completely different perspective on the nature of existence. We see that there is a whole series of schemas by which we attempt to comprehend phenomena. We can separate those schemas from the phenomena that we use those schemas to understand. That is why a General Schema Theory is possible, such as General Systems Theory. We posit that the complementary dual opposite of General Systems Theory is General Meta -systems Theory. Between these two are the Holonic schemas in which the dissipative and the reflexive are dual while the autopoietic is self - dual. All the higher dimensions other than fourth and third have one platonic solid that is self dual and two of which are complementary duals with each other. This pattern of the contrast of the self -dual and the actually complementary duals is seen in mathematics as well. But the duality does not stop there. There are a whole series of schemas that are used to understand the physis that are built up in the logos. We call the hierarchy of the found emergent levels of phenomena that resist reductionism, the ontic hierarchy. It is composed of levels of phenomena like quarks, particles, atoms, molecules, cells, organisms, social groups and Gaia. Everyone makes the divisions slightly differently. But these are contrasted with the emergent ontological hierarchy of schemas that can be talked about as having the following articulation:

Pluriverse
Kosmos
World
Domain
Meta-system (Archon)
System
Form
Pattern
Monad (Distinction)
Facet

These emergent levels of schemas contain many dualities within them. Each level is related to the next in the same way that the Meta -system is related to the System. The holons appear between each of the levels. Each level gets its properties as a conjunction of the two adjacent levels. Each level is dual with the opposite level at the other end of the hierarchy. All of this duality within the ontological framework of the schemas that we

project on existence gives us an insight into the utter complementarity of the holonic way of looking at things. There is a projection by which the ontological schemas are thrown onto the ontic realm in an attempt to understand the emergent properties of the things found in the realm of physus from the point of view of logos. Beneath that projection, there is something fascinating happening which we seldom see within the mechanism by which the projection is happening. We get at that by first separating the ontic from the ontological, i.e. by stopping the projection and considering physus (the ontic emergent realm) separate from the logos (the ontological emergent realm). When we stop the projection, i.e. suspend our belief in it, and allow the two realms to be seen as complementary duals rather than a dualism where one projects onto the other, i.e. where thought determines the structure of nature or nature determines the structure of thought, then we find some very interesting features of the world infrastructure that do not become apparent otherwise.

We must add that there is yet another pair of emergent hierarchies that have to be considered in our exploration of the structure of the world. This set has to do with the relation between the social and the individual processing of information.

Absolute
actualization
Existence
insight
Ontos
wisdom
Episteme
knowledge
Paradigm
information
Theory
data
Facticity
given
Suchness

The italicized words represent the individual's processing of information at various levels. The normal typed words represent a processing which mediates the social construction and invention of the world at various emergent levels of social comprehension. Note that this pair of emergent hierarchies, that are interlaced, points to a deeper dualism between the limited and the unlimited that underlie the articulation of the dualism between physus and logos as the limited. The absolute is the realm of the unlimited and suchness is the realm of the limited, and between the two there is the social and individual construction and invention of reality, truth, identity, and presence which is projected as Being and is ontologically distinct from beings within the world. The world has the structure of the Fourfold which, as Heidegger points out, is composed of Heaven, Earth, Mortals and Immortals. Heidegger takes this from Socrates who says in the Gorgias (507e) "*And wise men tell us, Callicles, that heaven and earth and gods and men are held together by communion and friendship, by orderliness, temperance and justice; and that is*

the reason, my friend, why they call the whole of this world by the name of kosmos." What is necessary to understand, however, is that this division of the world into the fourfold, cited by Socrates, is the articulation that held sway in the mythopoeitic times and that this has changed in the meta -physical times inaugurated by Thales and Anaxamander into the dualism of Infinite/Finite at the deeper level and Physis/Logos at the higher level. Our view of the structure of the schema of the world must exist within this framework of dualities as long as the Metaphysical Era continues to reign. However, we can extend this series of dualities both downward and upward to produce the chain of bifurcations in Being as it exists in the Meta -physical Era. This chain of bifurcations consists of at least eight layers of dualities within which are nested non -duals which are normally hidden, but when we cease to project and allow the different duals to exist independently, they become manifest¹¹² to the careful observer.

Particle	<i>Uncertain Complementarity</i>	Wave
Quantum Mechanics	<i>Spacetime</i>	Relativity
Physics	<i>InfoEnergy</i>	Thermodynamics
Physis	Orders	Logos
Limited	Rights	Unlimited
Have	<i>Goods</i>	Have not
Exist	<i>Fates</i>	Exist not
Actualize (paradoxicality)	<i>Sources</i>	Actualize not (supra-rationality)
Unmanifest = Extremal ¹¹³	<i>Root (Single Source)</i>	Manifestation

At each level, the left hand column bifurcates into the next higher dualism. The fundamental duals that make up the world structure have been made bold in this table. The non-duals are seen in italics. The dualisms arise out of the Root (or Single Source of causation) which bifurcates into what is actualized and what is not actualized flowing from the myriad sources of things within the subspace of negative dimensionality. That subspace is made up of Pascal's Triangle Hyper Complex Imaginaries that are produced by the Cayley-Dickson process and which is infinitely deep. But at the highest level, i.e. at subspace negative one, there is a single root for the differentiation of all the sources at the lower negative dimensions. The sources are the opposite of points, i.e. instead of being localized at one place, they are spread out all over the negative dimensional subspaces. These sources are the templates for the actualization of things within positive dimensional spacetime. Actualization leads to the placement of existences that we find and onto which we project Being turning existents into beings. What existences actually occur is a matter of selection that we call fate. Fate is a very fundamental non -dual within the Western worldview. Being and Having enter the Indo -European language complex together, and they share their extreme irregularity which shows that they are an artificial construct within these languages. Having and Not Having, i.e. possession and private property, is a fundamental theme within the Indo -European worldview in general, and

¹¹² Manifestation is the deepest level of disclosure beyond Existence and Being. It is nondual between Existence and Being. See An Approach Toward Being, Existence and Manifestation at <http://dialog.net:85/homepage/fe00v01.pdf>

¹¹³ The Extremal is the mixture of Paradoxicality and SupraRationality. It is the antipode to Manifestation. See "Autopoietic Meta-theory: Paradox and Supra-rationality" at <http://dialog.net:85/homepage/autopoiesis.html>

this theme points us to the importance of variety production which we call the good. Being proper appears at the level of the distinction between the limited and the unlimited which, in the Mythopoietic Era, was understood as the split between heaven and earth or Uranus and Gaia. In the metaphysical era, inaugurated by Anaxamander and Thales, the split between the Apeiron and the Peiron was inaugurated. Thales, suggested that the Apeiron or meta-physical principle underlying everything was Water, i.e. the water of life that circulates in the Indo-European primal scene of the Well and the Tree. Anaximenes suggested that it was air. In other words, the primal elements were seen as the source of the world. But Anaxamander realized that the meta-physical principle had to be something beyond the elements which were by their nature limited. All throughout the presocratic era there were many suggestions as to what should be the meta-physical principle. Eventually, Parmenides suggested Being as the principle par excellence and that was accepted by everyone except dissenters like Heraclitus. Since the time of Hegel, one of the followers of Heraclitus, we think of the Meta-physical principle as the Absolute. When the Absolute is combined with suchness we have what Hegel calls *Absolute Reason*, i.e. the reason which is embedded within the particulars of being. Thus, for Hegel, there is a cycle from the absolute back to the particular which most idealistic philosophies do not recognize. But this cycle informs the world with its dynamic of understanding, which we see as the interlaced emergent hierarchies that are social and individual. Hegel called this dynamic the advance of spirit in history. He thus produced the first philosophy since the Sceptics, like Sextus Empiricus, which was on the model of a dynamic dialectical system in which spirit moves through history continually advancing via Aufheben from one supervenient level to the next, continually developing deeper and deeper self-consciousness which, in turn forms a basis of consciousness within which representations appear, i.e. schema for understanding things in the world, which, through their articulation, leads to a new level of self-consciousness. The non-dual hidden between limited and unlimited is Rta, Asa, Arte, or Right which is the golden balance between limited and unlimited.

Within the Meta-physical Era, the split between physis and logos replaces the dichotomy between mortals and immortals. Immortals, i.e. the gods, have been supplanted by man himself, and man recognizes that he is split between consciousness and rationality **and** embodiment in matter, or his animality. Thus, man on the one hand is confronted by the physis, i.e. growing things beyond himself and his own growth and development, and the logos, i.e. the unfolding of thought and language within himself and his social group. Between physis and logos, we find the nomos, or order, as the non-dual that allows us to connect our theories with physical phenomena and thus we construct a science of the physical world. In that science, we distinguish thermodynamics from physics proper and that physics proper unfolds into quantum mechanics and relativity theory which are the micro and macro views of the workings of spacetime. Quantum mechanics unfolds two complementarity views of matter as both particles and waves which gives us some insight into the deep complementarity of the natural world as seen in Bohr's scientific philosophy. At the level of physis, we see the ontic hierarchy of phenomena which resists reduction and analysis which stretches from quarks, to particles, to atoms, to molecules, to cells, to organisms, to social communities, to Gaia. There are many ways to cut up the magma of existence by categorizations that see the ontic emergent levels in

various lights. On the other hand, there is the emergent ontological hierarchy of schemas which are the templates of understanding that the logos uses as a basis of comprehending how the outer world works. We use these templates to project on the ontic hierarchy as a means of subduing it and subjecting it so that it becomes our knowledge. But if we resist this desire to project on the ontic, we find that the ontological hierarchy has many strange aspects that we slowly discover are holonomic. First, the hierarchy stands under the pressure of skepticism which is the continual attempt to discount the importance of one or more emergent levels in understanding. Skepticism is the dual of the pressure of reductionism seen in the ontic hierarchy. They are both related to the pressure of nihilism on the social and individual hierarchies seen at the lower level of the limited and unlimited. Once we accept some set of schemas such as the one proposed here, then when we synthetically recognize their multiple complementarities, we see that they have the nature of holons and that they too form a ring of conjunctions which has the nature of interdependent arising. All of the schemas are a conjunction of the adjacent schemas in the hierarchy which loops back around to produce itself in the manner talked about by the Buddha in terms of Samsara, the wheel of birth and death.

THE SECRET OF THE WORLD

The world has a secret that can be discovered only when we disengage the dynamic of the dualism in which projection occurs at the level of physis/logos and in which the influx of Being as the absolute meta-physical principle into beings occurs at the level of the Apeiron/peiron. That secret appears only when the pressure of nihilism production at the level of limited/unlimited and the pressures of skepticism/reductionism at the level of physis/logos are let up for a moment. The world does not collapse when these pressures are alleviated. Instead, what happens is that we realize that the entire structure of the world is based on the relation between the non-duals and the dualisms which are bound together and manifest together in the infrastructure of the world. This is just like the structure of nonduality/duality we saw in the mobius strip and kleinian bottle example. Being is the paradoxical and even the absurd as a meta-physical principle. We attempt to change this so that we can comprehend the world by allowing the fragments of Being to appear, i.e. Pure, Process, Hyper, and Wild Being. These are segmented by the aspects of Being, i.e. true, real, identical and presence. These four kinds of Being together produce a series of higher logical types that are categorically articulated at each level by the aspect of Being. The paradoxicality appears in the topological analogy of the hyper-kleinian bottle. The bottle creates a tantamount ambiguity between self and other which can be infinitely deep as we produce higher and higher level hyper-kleinians. The higher level hyper-kleinians take us into higher and higher intensities of absurdity. But if we go in the other direction, the hyper-kleinian splits apart into two kleinian bottles which again split into four mobius strips which then split again into eight two-sided lemniscates. The lemniscates establish a natural duality which does not have any aspect of nonduality integrated into it. The lemniscates are interlocked in pairs, and further interlocked lemniscates can be produced by continuing the bifurcation process. We identify natural duality without nonduality with the supra-rational which is opposite the paradoxical. The supra-rational allows us to make non-nihilistic distinctions that are based in our hearts not our heads. When we break into duality, the nonduality becomes implicit, just as it is in

the bifurcating chain of Being which is a series of dualisms. The lemniscates are interlaced, and by an operation of joining, they reveal the nonduality that is hidden within their articulation. Similarly, the chain of Being has interlaced dualisms that we disengage. Where has the nonduality gone? It has gone into the discontinuities between the interlaced lemniscates. The discontinuities hide the non-duals, so the supra-rational is a marriage of the dual and the non-dual which allows the duals to be seen on the background of the non-dual discontinuities. Thus, the discontinuities between natural opposites hide the nonduality which is a background for the manifestation of duals. The bifurcation of two-sided and two-edged lemniscates can go on indefinitely within this non-dual environment of discontinuities. This is precisely the way it is with the structure of the world in general. It is made up of myriad dualisms which revolve around the core of the chain of Being which arises out of existence and actuality from the root. But within this chain non-duals are hidden. At the level of Being these non-duals are *nomos*, or order, and *arte* (*rta*), or right. Right allows us to comprehend the balance between Being and beings which called ontological difference. In the comprehension of that balance, both individuals and society differentiate themselves at various emergent levels by which knowledge is constructed or invented about the world. But up at the level of *nomos*, we find a separation between the ontological schemas and the ontic phenomenal coherences at various emergent levels. Almost any schema can be applied to any level of phenomena. The phenomena appear different depending on what schema we use to attempt to comprehend them. Various combinations of schema give us particular insights into the phenomena that other combinations do not. Thus, the schemas, when brought into conjunction, have an illuminating effect which are not necessarily implicit within the phenomena themselves as ontic realities. The phenomena are what Cornelius Castoriadis calls *magma* upon which we project our categories in the process of social institutionalization, construction and invention. We need to allow the magma to be just that, undifferentiated yet still distinguishable in multiple ways depending on what schemas we bring to bear. We need to allow the schemas to interact with each other so that their special illuminating effects can be seen with respect to various phenomena. It is by this means that the emergent transformations occur at the various social levels that we experience as paradigm shifts, episteme changes, transformations of our interpretation of Being, and new perspectives on existence. There is only one meta-physical principle, but myriad sorts of suchness. That suchness is differentiated into *logos* and *physis* and is insipidated by Being as it differentiates the myriad beings into those that have their being in *physis* or *logos* or both as we do. What we realize is that the ontological hierarchy and the ontic hierarchy are two different ways of looking at suchness as it is saturated by the Absolute which we, in our tradition, interpret fatefully as Being. We only see the supra-rationality of existence by separating everything, underneath every being is an existent which we see by interpreting them in terms of neither this aspect nor its opposite. Thus, every existent is neither true nor false, neither real nor unreal, neither present nor absent, neither identical nor different. To interpret them in the opposite way produces the quintessence, i.e. both present and absent, both identical and different, both real and unreal, both true and false. When we lift the barrier of the excluded middle, both existence and the quintessence become possibilities for looking at the world. The quintessence¹¹⁴ sees the world in terms of the fusion of the holoidal, in which everything

¹¹⁴ Called by the Alchemists the Philosopher's Stone (*Lapis*).

is real, true, identical and present, i.e. the monolith of Being, and opposite, i.e. the ephemeron where everything is false, illusory, different and absent. In the quintessence, the paradox of Being is bodied forth for us in our experience. Whereas in existence, everything is separated into the supra-rational background of utter discontinuity that makes present the void or emptiness of existence. What is non-dual between the quintessence and existence is manifestation proper, i.e. the non-dual between continuity and discontinuity as fundamental presuppositions concerning the nature of things in the world.

We get some inkling of this when we look at the ontological emergent hierarchy. In that hierarchy, as Onar Aam has pointed out, there are facets which are wholes that cannot be parts, like quarks, and there is, at the other extreme in the pluriverse, parts that cannot be wholes, like the whole universe which we cannot see the edge of and which we are embedded in. Holons, like the intermediate levels of schema, are both wholes and parts at the same time. They are composed of wholes-that-cannot-be-parts and parts-that-cannot-be-wholes juxtaposed with each other. The opposite of the holon is the holoidal or the hologram which is a partial part and a partial whole in which multiple perspectives see partial views of both part and whole. When we think about it, the denial of part or the denial of whole can be slid up and down the ontological hierarchy¹¹⁵. Thus, any adjacent layer on either side can be seen as a whole that has no parts or a part that cannot be whole. When we consider this carefully, we realize that this means intermediary concepts are necessary to produce the holon in the middle which gives the part what it needs to become whole or gives the whole what it needs to become a part. Looking at these intermediate concepts, it becomes clear that what is at play is our concepts of countable and non-countable things. We see the higher level as a mass which needs a bound in order to have part instances. We see the lower level as something countable that has attributes to which we add a universal to allow the part particulars to become whole. At each level, there is the upper level mass and the lower level attributes that, through bounds and universals, become instances and particulars. The particular instance is the holon which is at once the part and the whole forged out of the part-that-cannot-be-whole, like the pluriverse, or the whole-that-cannot-be-part, like the facet. The bound allows the mass to become an instance, and the universal allows the attribute to become a particular. The particular instance is the holon between these two adjacent levels. Bob Cummings realized that the parts that cannot be wholes and the wholes that cannot be parts could slide up and down the ontological hierarchy producing limits at any level. For our purposes here, this could relate to the meta-system and the system. The meta-system is considered as mass, or non-countable, while the system is considered as countable. By using the bound and universal that mediate these limits to the Holon, we see the special systems between the two adjacent schematic levels.

This shows how strange the ontological hierarchy is to us, which, in the midst of projection we are blind to, and becomes apparent only when we immerse the structure of the world in the supra-rationality of existence. Then we see the complementary duals and the non-duals out of which the world is constructed clearly. They are tightly interwoven. Each level of dualism has embedded in it a non-dual. At the level of Being, these non-

¹¹⁵ This insight came from Bob Cummings.

duals are *right* and *order* which are internal to the physus/logos and the limited/unlimited dualisms. Between the Absolute and suchness, we attempt to find the non-nihilistic distinctions against the pressure of the continual production of nihilistic opposites. Between physus and logos, we attempt to understand the suchness which has been inspissated with Being by producing a bridge of order between phenomena and our theories. The theories are based on schemas that can be applied to the emergent levels of the physus in the ontic hierarchy. When we separate these two emergent hierarchies and stop projection, we notice the strangeness of both of them. The strangeness of the ontic hierarchy is the fact that it is a magma that will accept multiple categorizations and schematizations, none of which can claim complete victory. The strangeness of the ontological emergent hierarchy of the schema is the utter complementarity of all the schemas with each other in a way that shows their holonic infrastructure. That holonic infrastructure has within it the secret of the special systems that mediate between each level of the ontological hierarchy just as it has been shown to mediate between system and meta-system schemas. The special systems interact with each other and the system to produce, via the emergent meta-system, the meta-systemic level. This dynamic interaction of holons is what produces the interdependent arising of the holonic hierarchy of the schemas. The meta-system, as a whole that cannot have parts, is composed of myriad complementarities which arise through the nonduality of the holons out of the unity of the system considered as a part that cannot be whole. Thus, there is a dynamic interplay between dualities and non-dualities that must be the foundation for our understanding of the world and all the other schemas in the ontological emergent hierarchy.

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Kent Palmer is a Principle Systems Engineer at a major Aerospace Systems Company. He has a Ph.D. in Sociology concentrating on Philosophy of Science from the London School of Economics and a B.Sc. in Sociology from the University of Kansas. His dissertation on The Structure of Theoretical Systems in Relation to Emergence¹¹⁶ focused on how new things come into existence within the Western Philosophical and Scientific worldview. He has written extensively on the roots of the Western Worldview in his electronic book The Fragmentation of Being and the Path Beyond the Void¹¹⁷. He had at least seventeen years experience¹¹⁸ in Software Engineering and Systems Engineering disciplines at major aerospace companies based in Orange County CA. He served several years as the chairman of a Software Engineering Process Group and is now engaged in Systems Engineering Process improvement based on EIA 731 and CMMI. He has

¹¹⁶ <http://server.snni.com:80/~palmer/disab.html> You may also try <http://dialog.net:85/homepage/> or <http://think.net/homepage/> for any of the web related material.

¹¹⁷ <http://server.snni.com:80/~palmer/fbpath.htm>

¹¹⁸ <http://server.snni.com:80/~palmer/resume.html>

presented a tutorial on “Advanced Process Architectures ¹¹⁹” which concern ed engineering wide process improvement including both software and systems engineering. Besides process experience, he has recently been a software team lead on a Satellite Payload project and a systems engineer on a Satellite Ground System project. He has also engaged in independent research in Systems Theory which has resulted in a book of working papers called Reflexive Autopoietic Systems Theory¹²⁰. A new introduction to this work now exists called Reflexive Autopoietic Dissipative Special Systems Theory¹²¹. He has given a tutorial ¹²² on “Meta-systems Engineering” to the INCOSE Principles working group. He has written a series on Software Engineering Foundations which are contained in the book Wild Software Meta -systems¹²³. He now teaches a course in “Software Requirements and Design Methodologies ” at the University California Irvine Extension. He may be reached at palmer@think.net.

¹¹⁹ <http://server.snni.com:80/~palmer/advanced.htm>

¹²⁰ <http://server.snni.com:80/~palmer/refauto2.htm>

¹²¹ <http://server.snni.com:80/~palmer/autopoiesis.html>

¹²² <http://dialog.net:85/homepage/incosewg/index.htm>

¹²³ <http://server.snni.com:80/~palmer/wsms.htm>

SIG: Processes and Human Processes

ABSTRACT

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HOLONOMIC HUMAN PROCESSES

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I would like to submit a presentation concerning my research on Reflexive Autopoietic Dissipative Special Systems Theory which is embodied in a paper of that name ¹²⁴. This work combines the theories of Prigogine, Maturana and Varela with the theory of Reflexivity in Sociology such as that of O'Malley and Sandywell in a novel and perhaps interesting configuration. The paper answers to almost all the points that you have made in your call for papers.

"(1) Process Methods. Papers on analytic methods to study novelty, complexity, diversity, episodic patterns (complexes), asymmetry, and all other features of creative processes in time series and other empirical data."

The theory presented under the title Reflexive Autopoietic Dissipative Special Systems Theory is primarily a process theory. It defines systems as social gestalts and talks about social construction of such gestalts in terms of both gestalts and flows. It distinguishes these from the proto-gestalts and proto-flows that constitute the background of all gestalts and flows. This process work takes a standpoint similar to Rescher in his recent introduction of process metaphysics. Rescher says that process metaphysics should be connected in a fundamental way to systems theory. I have attempted to forge such a connection under the rubric of social phenomenology.

"(2) Empirical Applications of the Process Paradigm. How can one apply the process approach in scientific research, clinical practice, organizational development, or social action? We particularly welcome contributions that include empirical data."

In my paper I point out anomalous physical systems that have the characteristics of the special systems that are described in my paper. Thus the theory presented in the paper is grounded in empirical evidence of specific anomalous physical phenomena.

"(3) Advances in Process Theory. Process theory of processes is an evolving set of scientific hypotheses. A hypothesis is scientific when it is grounded on observation, clearly formulated (mathematically whenever possible), experimentally testable, and practically applicable. Processes must be described in terms of physical dimensions, plus additional dimensions of information and organization not included in standard physics."

In my paper I describe how normal scientific endeavors miss the existence of the special systems and describe a different kind of science founded on Plato instead of Aristotle which is focused on anomalies rather than the common experiences of the many. I show

¹²⁴ See <http://server.snni.com:80/~palmer/autopoiesis.html>

how the western tradition is lopsided because it focuses on systems but ignores environmental ecosystems or meta-systems and their intrinsic relation to systems. I then describe how out of a balanced perspective that values both systems and meta-systems that we apprehend the special systems which are of three succinct types, dissipative, autopoietic and reflexive. Then, I show how physics has found phenomena that corresponds to these kind of special systems but has not recognized their relation to each other as a set of emergent levels that exist mediating the relation of systems to meta-systems.

"(4) Mathematical Models. Papers on bios, chaos, recursive equations, strange attractors, and other mathematical models of natural processes."

Special systems theory is founded on the mathematical basis of hyper-complex algebras and thus has a firm foundation within the realm of mathematics for the theory of special systems. These special systems combine into the emergent meta-system which is a description of how normal and the special systems work together to produce another higher emergent level. I also show how these special systems are exemplified by other mathematical anomalies as well such as the topological anomalies of non-orientable surfaces.

HOLONOMIC HUMAN PROCESSES

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SUMMARY

See Abstract.

Keywords Life Ontology, Holonomics, Meta-Systems, Special Systems

INTRODUCTION

Rescher suggests that we should consider the relation between process philosophy and systems theory. In what follows we will attempt to take up that suggestion but in a new and different way exploring holonomic human processes. Holonomics studies the nomos or order of holons. Holons were first named by Koestler in Janus where he talks about things that are both wholes and parts at the same time. This suggests that there is a way of looking at things that avoids the dualism of whole and part and thus posits a non-dual alternative vision of existence.

When talking about Holonomic Human Processes we will use the philosophy of Deleuze and Guattari as our point of departure. They posit three levels when considering human life which they call the socius, the individual as organism and desiring machines. In their philosophy individuals as persons are made up of desiring machines embedded in the social field, i.e. the socius. What is good about the theory of Deleuze and Guattari is that they have attempted to build a theory of the at the level of Wild Being which has interesting relations to the holonomic theory that we will propose.

In the history of Western Ontology the term Being has been thought of as the most general concept and thus the emptiest concept for a long time. Only in the last century was it discovered that Being actually has structure and in fact is fragmented at its very core. When we consider Being in the context of the entire tradition we discover that it is a very paradoxical term which has been interpreted many different ways by different philosophers in different centuries. We can appeal to Russell and Copi's theory of higher logical types to break up this paradox into something that reason can deal with. Thus we can continuously go to higher and higher logical types whenever we are confronted with paradox. And as they observed we not only need meta-levels of Being but also categorical types at each meta-level. These are supplied by the aspects of Being, namely truth, reality, identity and presence. The meta-levels of Being are called Pure, Process, Hyper and Wild. There is no fifth meta-level of Being. At the fifth meta-level we confront the unthinkable. Parmenides said that Being and Thought are the Same. Thus where thought ends so does Being. This unthinkability at the higher meta-levels of Being

is identified with Existence. When the aspects of Being are expressed in existence beyond Being then we call this level, which starts at the fifth meta-level, Ultra. Truth at each meta-level of Being has a different significance. The same is true of the other aspects.

Heidegger was the one to identify the difference between Pure Being, the traditional static Being of the present instant first described by Parmenides. Process Being was first described by Heraclitus when he said all was change. Heidegger in Being and Time talks about these as two complementary aspects of our being-in-the-world, as two modalities named present-at-hand and ready-to-hand. Merleau-Ponty in his book The Phenomenology of Perception shows that present-at-hand relates psychologically to pointing and ready-to-hand relates psychologically to grasping. Later Heidegger goes on to talk about ~~Being~~ (crossed out). Derrida talks about this in terms of what he calls differance, which is differing and deferring. Merleau-Ponty calls this the hyper dialectic of Heidegger's Process Being and Sartre's Nothingness. From this expression of Merleau-Ponty I derive the name Hyper Being which can be said to be the in-hand modality of being-in-the-world. Levinas talks about this level of Being as "beyond Being" by which he means beyond Process Being of Heidegger. It is where ethics and metaphysics collapse together in the mutual bearing of mother and child. We can think of the in-hand as the expansion of being-in-the-world, like with the blindman learning to see with his stick or the guitarist who masters his instrument such that it becomes part of him. Finally, Merleau-Ponty in The Visible and the Invisible distinguishes Hyper Being from Wild Being, which is what is left over when Process Being and Nothingness, its antinomic metaphysically opposite principle, cancel. Merleau-Ponty calls this encompassing Flesh. Deleuze and Guattari refer to it as the Rhizome. Cornelius Castoriadis calls it the Magma. John S. Hans calls it Play in his book Play of the World. Since the fourth meta-level was discovered many different philosophers have attempted to build a philosophy at this highest meta-level of Being. That is very difficult because the conceptual headroom is very limited, in fact Wild Being is merely a surface not unlike the surface that produces the Mandelbrot Set that occurs in the real/imaginary plane where every point no matter at what scale partakes in a fractal structuring that occurs when the points are iterated in away that allows us to color them with respect to their escape velocity. Every point has a chaotic "line of flight" or intensity that when taken together shows us a complex fractal patterning. This infinite chaotic fractal patterning is the expression of Wild Being. Wild Being is the contraction of being-in-the-world that occurs after the expansion of Hyper Being.

Here we shall take another completely different route toward the understanding of the holonomic character of Human beings which follows the series of meta-levels up from our normal level of discourse sanctioned by scientific convention in Pure Being or the present-at-hand. We note that in Pure Being there is a subject/object or mind/body dichotomy which is an inescapable dualism. That duality is understood by Buber in terms of I-It relations which reify and objectify the alter-ego. Buber suggests that we need to develop I-Thou relations with the other which allows it its otherness which is maintained in the course of the dialogue. Jung on the other hand wants us to individuate our ego as unity into the Self as a totality that encompasses its own otherness which it normally

rejects. Thus we could imagine the building of Self-Thou relations which would combine the insights of both Buber and Jung.

When we move up the meta-levels of Being we discover along with Heidegger in Being and Time that there is something prior to the subject/object dichotomy which he calls Dasein, or being-in-the-world. It is the ecstasy from which the world overflows out of a particular instance being, our own being. Dasein exists at the probabilistic level that is the basis for constituting the deterministic illusion of the ideas of Pure Being. Out of Dasein both subject and object (I and It) unfold. Dasein is essentially a process of projection of the world out of one of the beings in the world, i.e. ourselves. The Subject/Object dichotomy at the ontological level is rephrased into the statement "Being Is". Being is its own object and its own subject. At the level of Process Being this is rephrased as "It Gives" which Heidegger calls Appropriation which stands opposite the nihilistic enframing of Pure Being. Here the emphasis is on the process of giving, i.e. the verb rather than sameness of Noun and Verb in the statement "Being Is". What does it give? "It Gives" itself to itself.

If we want to go deeper than Dasein we next encounter what I call the Query in Hyper Being. The Query steps back from the projection and asks who is projecting. This Query finds only undecidable and uncertainty and no answer to that question, i.e. who is asking? The Query is who we are as a primordial self-consciousness who is never exactly who he or she thinks they are. Who is liable to laugh in the midst of grief or to cry in the midst of happiness. It is not the reified self-consciousness of Hegel which gains distance from itself through representations. But instead it is what Paul Simon calls a "slip-sliding-away". Derrida calls it the differing and deferring of differance. Heidegger calls it ~~Being~~ (crossed out). It is the difference between Pure Being and Process Being as modalities within the monolith of the entirety of Being. It is the non-decidability of Godel's theorem, where we cannot decide if the statement is inside or outside the formal system that gives rise to it. The Query is a horizon of possibilities that lies hidden below the probabilities which open out and gives us room to ponder various ways we might be in our world, and through those possibilities we get some perspective on the world that we do project. At the level of the Query the space in the phrase "Being Is" becomes the point of indecision between noun and verb.

To go deeper still we enter the realm of Wild Being and there encounter ourselves as the Enigma. The Enigma is the lack of an answer to the question concerning the nature of the I or the Self. Neither are to be found by rigorous analysis of the world in which we live. We are the greatest enigmas of the world, we who are its source are nowhere to be found in it. This lack of self or lack of I-ness is seen in the chiasm of the touch touching which Merleau-Ponty calls Flesh. Here the difference of thoughtfeelings and feelingthoughts is seen as a difference of emphasis which underlines the existence of some pocket of reversibility in the intaglio of the two non-dual ways of looking at things within ourselves and within the world. This pocket which is obscure or opaque is pure nonduality of existence which is itself empty.

When we enter the emptiness of the truly non-dual we discover the utter emptiness of the Self or Ego, either one. This emptiness is matched by the emptiness of Other and Alter - ego. It is this emptiness that was described by Nagarjuna the great Buddhist metaphysician as the difference between the both ...and... and the neither ...nor of Indian logic which we do not see in Western Logic because of the principle of Excluded Middle. If we allow as Priest does Para -consistency and Para -completeness in our logic as the Indians did then it is possible to encounter emptiness and recognize it as the unthinkable basis of existence, the so called bedrock of existence prior to Being but also the dual of Being. Being is the projection of illusion onto this bedrock of empty or void existence. We call this Ultra Being, i.e. Being so refined that it vanishes like the homeopathic remedies past taken past Avogadro's number. Being at meta -levels of five or higher is no Being at all, it is in fact Existence. In Non-dual Vedanta of Sankara this is the realm of illusion or Maya. Only the four lower meta -levels are actually embodied as the projection mechanism of the illusion on the empty screen of existence. All the other meta -levels of Being are merely illusory and hide this emptiness of existence.

What we have seen so far is that there is a series of meta-levels to Being that if we follow them lead us up a series of stairs to nowhere. When we translate our present identity that we feel is true in the realm of logos and real in the realm of physis up these stairs we discover beyond the Subject/Object, Ego/Alter, Self/Other split, any deterministic dualism you might name, a series of levels called Dasein in Process Being, the Query in Hyper Being and the Enigma in Wild Being and which is discovered empty when we reach the level of No Being, which might also be called Ultra-Being where the aspects of Being are purified and become aspects of Existence.

If we look at the Hindu unfolding of Being as consciousness then we find the series Persona, Ego, Self, Atman, Brahma/Vishnu/Shiva and Nirguna Brahman. The persona is the masks we wear at any given time in a particular social situation. The ego is an artificial unification of these masks across time in many different situations. The Self which Kant calls the Transcendental Subject is an a priori synthesis, i.e. a synthesis prior to experience that our analysis must have as a starting point. The Atman is the Intersubjective Whole to which we belong or also our unity across multiple universes. The next level beyond that intersubjective a priori synthesis is the attributes of God while the attributeless Godhead is the last element in the series. All of these various levels of consciousness can be spoken of at the different meta -levels of Being. Thus we have followed the Ego, as I or unity at the center of consciousness, through the meta-levels of Being and we have followed the self as totality on the same path way as well. Whatever level of the unfolding of consciousness you want to choose may be treated to the critique of the deconstruction of Being from determinate, to probabilistic, to possibilistic, to its propensities and finally to the void itself. Thus the analysis of the various kinds of Being is orthogonal to the differentiation of consciousness into levels of unfolding.

Here we will concentrate on the Persona -Ego-Self-Atman progression. The difference between the Hindu and Western philosophy is that the Hindu sages start from the top and unfold the various lower levels whereas Western Philosophy as it is based on nihilism, skepticism and reductionism starts from the bottom and only allow for a higher level

when it discovers insoluble problems that force it to admit to a higher synthesis. To this series we will apply what we call General Schema Theory which posits a number of schemas that act as templates of understanding within the logos that are applied to the physis. Here we will focus in on the schemas of the System, Meta-system, Holons and World. We understand the System to be a social gestalt that is a whole greater than the sum of its parts projected from multiple perspectives within an intersubjective cohort. A meta-system is a field, or environment, or ecosystem, or context or situation that is a whole less than the sum of its parts, which means that it is full of holes or niches that are just right for the carrying of systems within it. Holons are wholes that are exactly equal to the sum of their parts, like perfect numbers where the divisors add up to the whole number exactly. Most numbers have surplus or deficit when their divisors are added up. Perfect numbers like 6, 28, 496 are very rare. But they have perfect balance between surplus and deficit. It turns out that just like in number theory there are three different kinds of numbers that act like perfect numbers. They are called the amicable, perfect and sociable numbers. Amicable numbers are a pair whose divisors add up to each other's total. Sociable numbers form a series where each number adds up to the next one's whole. The most prevalent number in these sets is four, although some sets have other numbers of elements that are sociable. Just like there are three kinds of numbers whose divisors add up to the whole of themselves or another which in turn adds up to its whole; so there is three kinds of holonomic systems where the whole is exactly equal to the sum of its parts. We call these the Dissipative Order Special System, The Autopoietic Self-organizing and Symbiotic Special System, and the Reflexive Social Special System. Instead of being based on number theory they are based on Hyper Complex Algebras. If the System is seen as determined by a Real Algebra, then the Dissipative Special System is seen as determined by the Complex Imaginary Algebra which adds conjunction between numbers, and the Autopoietic Special System is seen as determined by the Quaternion Hyper Complex Algebra that loses the commutative property, and the Reflexive Special System is seen as determined by the Octonion Hyper Complex Algebra that loses the associative property, and finally the Meta-system is seen as determined by the Sedenion and higher Hyper Complex Algebras that lose the division property. These Special Systems have some strange properties such as ultra-efficaciousness, i.e. ultra effectiveness and ultra-efficiency. That is because thermodynamically they begin with what Prigogine calls far from equilibria negative-entropic states in which order is spontaneously produced. A dissipative ordering system is one where order appears from nowhere and negative-entropically expands to fill the niche in the far from equilibria environment. Such systems can only be negative-entropic locally while globally entropy increase is maintained. But the local negative-entropic flow even though it cannot be energetically a perpetual motion machine, it may be tied to a strange attractor and produce an infinite amount of information. Two symbiotic dissipative ordering special systems can form an autopoietic special system which is stable instead of expanding and which uses the two flows of infinite information as a means of self damping and thus as a source of the impetus for self-organization. We use the theory of Maturana and Varela as the starting point for the understanding of these kinds of self-producing machines. Four symbiotic dissipative ordering special systems or two autopoietic self-organizing special systems form a reflexive social special system. We use the reflexive sociological theories of John O'Malley and Barry Sandywell as the basis for understanding these strange

heterodynamic duals of the homeostatic autopoietic systems. Reflexive special systems overflow their boundaries with the kind of ecstasy that Heidegger attributes toward Dasein while autopoietic systems merely maintain their boundaries and their own organization in the face of continuous change.

Now we advance the theory that what Deleuze and Guattari call the socius, individual and desiring machines as levels of organization that are psychologically meaningful can be seen in terms of the special systems. Thus the desiring machines are dissipative ordering special systems, the individual is a conjunction of these desiring machines at the level of the organism, and the socius can be seen as the reflexive special system. The nihilism of Deleuze and Guattari's approach to schizoanalysis of human experience is ameliorated when we realize that what they are talking about can be seen as existing in these holonic strata between the ego and the self, i.e. between artificial synthesis and natural pre-synthesis of the person. It is interesting to place this same schema in the context of Jung's thought. In Jung there are the various levels of the archetypes. We can see the special systems theory as contributing a holonic understanding of the nature of these archetypes.

	Self	Self as thou	Meta-system (general economy)
socius	Wise Old man	Cathonic Female	Reflexive special system
individual	anima	animus	Autopoietic special system
desiring machine	Shadow transforms when integrated into feminine wisdom of the Wise Old man	Shadow transforms when integrated into masculine wisdom of the Cathonic Female	Dissipative special system
	Male ego	Female ego as alterego	System (restricted economy)

However, this superficial paralleling of the Deleuze and Guattari model with that of Jung will not stand for long. Because as it happens Deleuze and Guattari may be better seen as dealing not with the relation between Self and Ego but in the relation between Self and Atman. And this in fact deepens our appreciation of the work of Jung. Jung talks about personal individuation leading to the development of a totality of the self out of the unity of the ego but not of individuated interpersonal relationships. Individuated interpersonal relations may be seen as operating between the Self and the Atman. Let us see how we can understand this different way of looking at the work of Jung and Deleuze and Guattari.

When I become individuated I develop a Self as a totality of who I am including both consciousness and unconsciousness. That self is a mandala like structure which constellates the archetypes that I develop from the collective unconscious. Jung felt that to develop the archetypes of the collective unconscious one had to individuate, i.e. pull away from collective consciousness. If both I and my mate do this then we are liable to meet at every level of the articulation of the special systems between the ego level and the self level of articulation. This is called in Alchemy the Mysterium Coniunctus, that is the meeting of the male and female at every holonomic level. Each person has alternate

layers of male and female and each of these meet giving outward marriage (brother - sister-hood) of the egos, erotic love between animus and anima, daemonic love between Wise old man and Cathonic Female, and agape between male wisdom of the Cathonic Female and the female wisdom of the Wise Old Man. In other words the various forms of love recognized by the Greeks appears at the various levels of the individuated relationship between two individuated persons.

However, when we look at the Self-Thou relations that is mutual between the conjuncted pair what is missing is Otherness. Both of the selves are Other to the Other. This realm of Otherness is brought out in the articulation of the Self pre-synthesis with respect to the Atman pre-synthesis. I have written of this before in terms of the Greimas square. Greimas uses the logical square of contraries and contradictions to produce a structural theory of narrative. What we learn from Greimas is that when we move from Self to Other there are two operations, articulation of anti-self and articulation of non-self. The Otherness of the other has logically to be seen as the anti-non-self and vice versa. There is an articulation of nonduality in the chiasmic reversibility between two anti-non-selves postulated from one in relation to the other and vice versa.

What we would like to do is expand the schema of Deleuze and Guattari to include more than just the Desiring Machine. Instead we would like to include Dissemination as well as the opposites of both, i.e. Avoiding and Absorption. We will call these the Dissipative Machines and see them as the nature of the relations between self -thou/thou-self which includes the otherness of both to each other. By otherness we mean true otherness beyond the projections and transference phenomena, i.e. unmotivated differences that arise spontaneously in the other that the self finds unexpected. When we look at the dance of the selves we see mutual desiring and avoiding as we see dissemination and absorption operating in the field between the selves. In the Self -thou relation the other stands as separate from ourselves in dialogue. But this does not say anything about the otherness of these to each other. That otherness reveals itself in the relations of desiring, avoiding, dissemination, and absorbing which altogether produce a reflexive field but in themselves are dissipative. When we connect these four kinds of dissipations to each other we get sixteen possible combinations which form autopoietic conjunctions. When we connect these autopoietic conjunctions to each other we get sixty four possible combinations, a veritable I Ching, at the reflexive level prior to the absorption into the Atman. We can see the socius as the field of the sixteen reflexive combinations of the four types of dissipative machines. We can see the individuated relations as the eight types of conjunction between the dissipative machines. We can see the machines themselves whether desiring, avoiding, disseminating or absorbing as the building blocks of individuated relationships.

Thus we can see Deleuze and Guattari as talking about a deeper level of pre-synthesis than the level of the self. That is why their emphasis is upon the social and the nations encompassed by the schizophrenic undergoing schizoanalysis. That is why they talk about the savage, barbaric and capitalist periods of the development of the ego. They are exploring beyond the self -thou dialogue into the inability to communicate between othernesses. Otherness is when the dissipative machines do not connect within the

rhizome. Self-thou only deals with the connections between the machines. But the rhizome has just as many breaks and failures to connect as it does connections. Individuated relations are those that particularize and instantiate sets of connections and disconnections between various dissipative machines. The dissipative machines hang off the body without organs, that is the social body, of the collective unconscious which is related to the collective consciousness discovered by a social phenomenology. Medals are there for all to see hanging on the chest of the general. They appear in collective consciousness but they emerge from the collective unconscious as orthogonal fragments that emerge as a social gestalt. Jung speaks about symbols and signs. But Deleuze and Guattari make the excellent point that if the partial objects have any relation to each other at all then they have been processed by consciousness. This is a higher standard for judging what is unconscious material. Unconscious material is orthogonal, i.e. unrelated to other unconscious material that has been brought to consciousness. When we talk about conscious or unconscious we must specify if we are talking about the individual or the collective.

Sartre has an excellent study of the fused group in the Critique of Dialectical Reason, which is the revolutionary group which arises prior to all institutionalization. Cornelius Castoriadis talks about how such a group institutes itself, i.e. reifies itself dynamically out of the magma of the social flux. Sartre speaks of a similar theme as he builds up the various kinds of institutions from the core of the revolutionary group which Castoriadis sees as Magma which like volcanic material can always push to the surface and break up institutional forms. Elias Canetti treats the same theme in terms of the Pack in Crowds and Power. Hannah Arendt calls the social The Blob¹²⁵. There is much distrust of the power of the mob and the role it played in the power of ideological movements like Nazism and Communism. But a genuine look at the foundations of life in a social pre-synthesis is necessary so we can understand proto-social grounds of our individuated lives. We can see Deleuze and Guattari beginning to explore this area beyond the self where there is true otherness which has to be experienced as the anti-non-self, i.e. radical otherness. Radical otherness between selves from both sides needs an explanation, and Deleuze and Guattari explain it by the failure to connect between dissipative machines in the rhizome of individuated relations that become social relations.

Recently there has been discovered the phenomena of Mentalizing as something different from thought. Mentalizing is reading others minds in terms of understanding their intentions. It is necessary for deception. Schizophrenic's and Autistic individuals have deficiencies in their abilities to mentalize. At a certain age children can suddenly mentalize, i.e. impute motives, intentions and knowledge to others different from those of the self and orient themselves to those others on the basis of the postulated motives, intentions and knowledge of the other. We postulate that Mentalizing is a different faculty than that of thought. In fact, we note that Heidegger ascribes three existentials to Dasein, i.e. Verstehen, Rede and Befindlichkeit (Understanding, Talk and Disclosedness). The intersection of all these is called Sorge (Care). But we can easily see that the intersections between any two can be interpreted as Logos (Understanding Talk), Physis (Disclosed

¹²⁵ The Attack of the Blob: Hannah Arendt's Concept of the Social Hanna Fenichel Pitkin (University of Chicago Press; 1998)

Understanding) and Praxis (Discovered Talk). What we notice is that Logos gives rise to Speech and Thought. Physis gives rise to Sensation and Perception. Praxis gives rise to Behavior and Mentalizing. It has recently been found using brain scans that mentalizing is in the same part of the brain as behavioral mechanisms and is not associated with centers of thought. Thus mentalizing of another is a completely different operation than thinking about them. Mentalizing reads their minds, i.e. imputes motives, intentions and knowledge to them as a basis for behavior towards them. Mentalization is a kind of lost or suppressed function which has been recently re-discovered through studies of children that emphasizes our social interconnectedness. When we move beyond the Self into the realm of the social we find ourselves in a realm that goes beyond the duality of thought and perception into a realm which we can enter into based on our capability to mentalize. We mentalize based on our resonance with the other. Through this capacity we learn how to recognize the other as other and self as self and how to bring the other into a Self-Thou dialogue despite mutual otherness. Fred Alan Wolf talks about how it is dreams that allow us to make that self-other discrimination in The Dreaming Universe. Thus we can see that there is an implicit interrelation between dreaming and mentalizing. We can think of dreaming as a kind of shadow of our mentalizing processes. In dreaming we process the otherness of the kosmos in relation to our self. In the dream world as Jung recognized there are "Others", i.e. independent numinous complexes which he called the Archetypes. Mostly Jung considers the relation of the autonomous archetypal complexes to the Self as it occurs in dreams. But what he does not do is consider the relations of the archetypal complexes to each other. Considering this takes us directly into the Atman pre-synthesis as Jung was aware. We relate to one set of others in wakefulness and another set of others in our dreams. Sometimes these two sets overlap and many times they do not. The otherness of the others in dreams is greater than the otherness of those around us in wakefulness because of a lack of familiarity in many instances. If we posit that the ego is the center of consciousness in the waking state but the self is the center of consciousness in the dream, and as the dream weaver produces dreams that integrate conscious and unconscious materials, then we can see the others in the dreams as the others with respect to the self rather than the alters to the ego. Thus the mentalizing that occurs in dreams is of a higher type than that which occurs in mundane waking consciousness for the most part. It is a mentalizing of the true other rather than merely shadows of our projections.

When we look at the archetypes we need to think about the concept of the field of archetypes introduced by Von Franz in Number and Time. What we see is that there are holonic emergent levels between the system of the ego and the meta-system of the self. These levels are both part and whole at the same time and in them the whole is exactly equal to the sum of the parts. Thus we have levels of Anima, Wise Old Man, and Sophia (transformed Shadow) within us which are integrated into the totality of the self when we give up the artificial unity of the ego. But when we move beyond the Self into the realm of dialogue with the Thou of the other, then we must mentalize not parts of our self but what goes beyond our selves. We move into a field that contains the four disseminating machines which connect to produce the sixteen individuated relations at the autopoietic level and the sixty four social relations at the reflexive level prior to falling into the meta-systemic field of the Atman, i.e. the intersubjective pre-synthesis which boils up as the fused group occasionally breaking the reifications of institutionalization and allowing for

a new social construction or new social invention of truth, reality, identity and presence. The atman is what looks through everyone's eyes. The at man is what looks through your eyes in all the different universes in which you manifest. Atman is related to Purusha and Prajnapati. It is related to Ymir of Norse myth. It is the Giant that is sacrificed to give rise to the world in the Indo-European tradition. We are within that giant through our capacity to mentalize. It is mentalization that allows us to live within the waters of the Atman like fish in the sea, i.e. not noticing the medium within which we live, like the way we ignore the air. We live in a similar social medium that predates our developing as individuals. The field of that mentalization of the other can be seen as an I Ching of possible combinations of the dissipative machines. This field of possible states of mentalization allows us to understand how to connect the dissipative machines to each other from self to other, other to self, self to thou, thou to self. The rhizome of these connections and disconnections forms a field within which nodes of the sixteen individuated relations appear. Meta-relations (relations between relations) in this field are reflexive. Beyond the reflexive we fall into the meta-system of the atman as the pre-synthesis of the Planetary Mantalked about by Desan.

We know that the kinds of Being and the holonic special systems mutually define each other. Thus as we are moving up this series either between ego and self or between self and atman we are moving through the different kinds of Being.

Kinds of Being	Emergent Systemic Levels
	System = thermodynamic-living-social gestalt
Pure Being	
	Holonic Dissipative Special System = Thermodynamic
Process Being	
	Holonic Autopoietic Special System = Living
Hyper Being	
	Holonic Reflexive Special System = Social
Wild Being	
	Meta-system

In this way we are moving from determinate and continuous systems toward discontinuous and indeterminate meta-systemic fields. We do this over and over as we move from persona to ego to self to atman to the attributes of god to the godhead. The attributes of God appear as manifestation between being and existence. The system is indicative of Being while the Meta-system is indicative of Existence. Between the two are the holonic intermediaries which are both dual and non-dual at the same time¹²⁶. We can see this differentiation either topologically in terms of non-orientable surfaces or

¹²⁶ Those point toward manifestation which is the non-dual between existence and being. So for instance the attributes of God, i.e. Brahma/Vishnu/Shiva, beyond Atman are known by the fact that they are non other, i.e. in the field of otherness God cannot be other but is the single and unique nonother. But this does not mean that God is Pantheistically identical to the Self. The Godhead as well can be understood as the non-dual beyond and within the attributes of God.

algebraically. In either case there is a definite movement from the paradoxical to the supra-rational through a series of dual/non-dual stages which take us from unity to totality. There is not only local and global duality but also local and global coherence at play in this staged transformation of the ego's unity into the self's totality. The same staged transformation occurs between the Self's totality and the Atman's wholeness. The self is a collection of all the unitary complexes or archetypes that exist within it including the most enigmatic and mysterious of all, the ego. The ego is like the mirrored balls of the quaternion or octonion imaginaries, inside it is utterly opaque although it seems to be the center of clarity and the light of the clearing in Being. It is a droplet of oblivion.

The Self is a totalizing collection of these droplets of oblivion that inhabit the horizon of awareness that includes both consciousness and unconsciousness. The self as a meta-system is a detotalizing totality as Sartre pointed out. The Atman is a wholeness which includes both the Holoidal and Ephemeronal combinations of the aspects of Being. The aspects of Being are permuted between totally true, real, identical, and real which is holoidal utopian Being on the one hand and the totality false, illusory, different and absent on the other called the Kakatopia¹²⁷ of the Ephemeron. The entire spectrum of combinations of the aspects of Being form the basis of wholeness. It is not just the total collection of what is but is instead the wholeness of all possible combinations that may be. Thus wholeness is associated with the Good which is the root of variety production. Wholeness is not just the perfected holoidal state but encompasses all possible permutations including the ephemeron. It is epitomized by the quintessence which is both true and false, real and illusory, identical and different as well as present and absent.

When we look at the ego and the persona we would find a very similar transformative unfolding. Persona is the mask in a certain situation. Personas are fragments of the ego which are not unified. We can think of the personal as having some but not all the properties of a formal system which include completeness, clarity (well-formedness), consistency, coherence, verifiability, and validity. These are the relations between the aspects of Being. Unity of the ego demands all of these things at once which produces a closed and stable system we call character. Persona is a form which is a figure in the system of the ego which is one unity among many in the meta-system of the Self. The persona can be seen as the interface of the dissipative machines. Through those interfaces we set up to either disseminate, desire, avoid or absorb what the other offers us. These interfaces to the other are formed into an artificial unity over time by the ego who has the ideal of remaining utterly consistent, complete, clear (well formed), verifiable, valid and coherent as a formal system. These properties are the relations between the aspects of Being. If we consider the ego as just a formal system then it would only have completeness, consistency and clarity as its properties. It is only when we add reality as an aspect that the properties of verification, validation and coherence become important. Reality is determined by testing the individual ego, and so by testing we consolidate the ego as the plethora of test results over time. This consolidation leads to more than formal unity but also systemic unity, i.e. the unity of the flow and gestalts of consciousness. However, due to the suppression of contradiction and the exclusion of the middle para-consistency, para-clarity and para-completeness are not allowed. This exclusion of what

¹²⁷ Hell on earth.

is not complete, consistent and clear from the ego produces what Jung calls the shadow. But we must also consider para -validity, para-verification, and para -coherence. All of these produce shadows around the ego that are indicative of its relation as a restricted economy to the general economy of the self. We note that the persona relates to the dissipative machines and acts as their interfaces. The ego attempts to produce an artificial unity of a system, i.e. of gestalts and flows, which allow the aspects of Being to be seen in consciousness. What does not conform to this view, enforced by the filter of the meta -system, is suppressed into the unconscious. One thing that does not conform to this view is that macro quantum mechanical view of existence that recognizes the nonduality of quality and quantity. The meta -system determines what kinds of systems will be allowed within its environment. Thus the Self is the total field of possible ego formations. Similarly the Atman is the whole field of possible self formations. Self restricts ego formations and provides niches for acceptable ones. Atman restricts self formations and provides niches for acceptable ones. With the persona there is a kind of reversal because the various persona are fragmented and have not always been integrated, being a conglomeration in many cases. The ego to the extent that it gives Being to these persona or their facets accepts them as parts of itself. What is rejected falls back into the field of the unconscious as the background of the gestalt of the ego in consciousness. Thus the ego is not a totality to the persona in the same way that the self is a totality to the unity of the ego or the atman is a whole to the individuated self. But if we are talking about accepted personas then the ego is the unity of accepted personas where each persona is a partial coherence¹²⁸ in a particular situation.

A persona is a gestalt or flow of the individual within a certain situation. I recommend the concept of Coutu in Emergent Human Nature where he introduces the TINSIT or tendency-in-situation as the basic unit of social analysis. I believe this has merit because it brings us back to Wild Being which is at the level of Propensity, Tendency, Line -of-flight or Habit. Each of us has certain tendencies in situations to desire, avoid, disseminate, or absorb. The persona is the vehicle for the establishment of these kinds of relations with others. These TINSITS form the basis of the social field which we mentalize as we resonate with others. We do not think about these tendencies consciously but merely react based on our mentalization of the states of mind of others as we know them from our experience with them as we are absorbed in the They. I also recommend William Sadler's ideas in Existence and Love where he talks about existentialism's over individualistic bias that comes from our nihilistic and dualistic culture. He likens the relation to the other through romantic love to music rather than perceptual gestalts and flows. The gestalts and flows of music are all space filling and interpenetrating. Just as love fills the whole world of the lovers so sound fills the whole environment with a fabric that covers everything. Thus the ego can be seen as an artificial systemic unity that arises out of the totality of the self as a meta -system just as the self as system arises out of the meta-systemic pre-synthesis of the wholeness of atman. So too does the persona arise out of the ego either as a projected façade, which can be used for deception in a mentalizing field, or as a rejected aspect of the ego that appears as the shadow. The interpenetration of the shadows making umbras and penumbras in multiple directions because of multiple sources of light is an analogy for the embodied field of the Self itself. The self also has a

¹²⁸ Or completeness, clarity, consistency, verifiability, or validity

shadow which is its otherness that it casts producing umbras and penumbras in the meta-system of the whole atman. The atman is a totalization of all perspectives, just as the self is a totalization of all unities in awareness. The ego is a totalization of all accepted personas which are forged into an artificial unity across time. The persona is a totalization of all the tendencies in the situation which along with the possibilities produce a probabilistic action which we gloss determinately in terms of ideas and emotions. As a mask the persona has no depth. The mask is merely the defense mechanism to the mentalizing of the other. It can have various levels of reification depending on the level of Being that it is produced at. There is the fully reified mask of ideas and emotions. There is the process by which thoughts and feelings become ideas and emotions. There is the indecision between thought and feeling. There is the chiasm between *thoughtfeelings* and *feelingthoughts*, and there is the non-dual field of the heart itself which is supra-rational and unthinkable by reason. The persona can exist at any of these levels of Being and the persona can also be seen as conjunctions of tendencies -in-situations. A tendency -in-a-situation is something dissipative in relation to the practical -inert of already composed human encounters. Conjunctions of tendencies in situations produce autopoietic relations between tendencies which when conjuncted again produce reflexive relations. Barry Sandywell talks about pre-reflective, reflective and reflexive. Reflective relations needs representations to produce consciousness and self-consciousness. Reflexivity is something different from reflectivity. It spills over into the social construction and social invention that is an ecstasy of the persona that takes into account the full dramatically situation not just the relations between characters taken in pairs.

CONCLUSION

In this paper we have explored a way of looking at human processes based on meta-systems and holonic special systems theory. It would be possible to go on further than this to look at the action of the Emergent Meta-system that dynamically combines the various holonic levels with the system level to produce the meta-system level. It would be possible to look at each of the stages taken above and show how each one can be seen as an Emergent Meta-system. Jung has done this in his Alchemical works where he explores the dynamics of the self such as Aion and Mysterium Coniunctus. We have not done so here for the sake of brevity. However, it is important to understand that the holons between the system and meta-systemic field combine with the system to produce the meta-system. We have seen that it is possible to read Deleuze and Guattari as if they were exploring the relations between total Self and whole Atman rather than as Jung has done exploring the relations between the unified Ego and total Self. This amounts to a deepening of Archetypal theory in which we explore reflexive individuated relations between self and other rather than merely the individuation of the self.

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¹²⁹ <http://server.snni.com:80/~palmer/disab.html> You may also try <http://dialog.net:85/homepage/> or <http://think.net/homepage/> for any of the web related material.

¹³⁰ <http://server.snni.com:80/~palmer/fbpath.htm>

¹³¹ <http://server.snni.com:80/~palmer/resume.html>

¹³² <http://server.snni.com:80/~palmer/advanced.htm>

¹³³ <http://server.snni.com:80/~palmer/refauto2.htm>

¹³⁴ <http://server.snni.com:80/~palmer/autopoiesis.html>

¹³⁵ <http://dialog.net:85/homepage/incosewg/index.htm>

¹³⁶ <http://server.snni.com:80/~palmer/wsms.htm>

SIG: Spirituality and Systems

ABSTRACT

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GENUINE SPIRITUALITY AND SPECIAL SYSTEMS THEORY

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Special Systems theory and their combination into the Emergent Meta -systems has a special relation to spirituality in as much as we define genuine spirituality as being related to the experience of and orientation to formlessness. We see this kind of genuine spirituality in several relations such as the Void of Taoism, the Emptiness of Buddhism and the Annihilation of Islamic Sufism. The point of special systems theory which is treated in my paper on Reflexive Autopoietic Dissipative Special Systems Theory at <http://server.snni.com/~palmer/autopoiesis.html> is that it provides a specific theory of how things in the mundane world unfold from the void. Thus as the Heart Sutra says Form is Void and Void is Form. The special systems theory and its combination into emergent meta -systems theory specifies a concrete theory of how this interchange between void and form occurs in terms of the embodiment of a model of interpenetration which is supported by a mathematical basis and specific anomalous physical phenomena which embody these very strange mathematical forms seen in hyper -complex algebras which form the basis of this theory. An extension of the theory hypothesizes that the Buddha discovered the ground of special systems theory within the mundane world and called it enlightenment. It is also seen as embodied in the sunnah and sharia of the Prophet Muhammad which all sufic practices are based upon. There is evidence that it was this ground of special systems that the Taoists were referring to in the Tao Te Ching and other recently discovered Taoist works. The key point is that genuine spirituality is founded on the relation between void and form and it is the special systems theory and the emergent meta -systems theory that gives us the first and only concrete model of this strange and beautiful relationship which is described in Taoism as the arising of everything from the gate of the mysterious female, i.e. the aspect of the void which is embedded in forms as their reference back to their source.

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SUMMARY

See Abstract.

Keywords Life Ontology, Holonomics, Meta-Systems, Special Systems

INTRODUCTION

In this paper genuine spirituality will be defined as any discipline that is concerned with formlessness which involves an understanding of the spirit or soul which are formless aspects of the human being. In other words it is concerned with how the formless aspects of ourselves relate to formlessness beyond ourselves. Of course, formlessness itself is an unpopular subject for science which deals exclusively with forms, or attempts to. Sometimes the objects of science can only be studied by the traces of formless entities on other forms. But in general science imagines even those things it cannot see directly as having form. Western Science has developed a very sophisticated approach to understanding forms using what may be called Formal Structural Systems Theory. A good example of such a theory is Klir's Architecture of Systems Problem Solving. It uses the schemas of System, Pattern and Form together to describe, explain and prove things with respect to forms. Notice that the system appears as a social gestalt at one level above form while the structural or process patterning appears as one step below form. Thus form is the basic schema by which we understand things in the world. We have expanded our horizons somewhat by developing schemas above and below the level of form to explain some things that the schema of the form cannot explain. In the papers associated with this conference¹³⁷ I have suggested that we should also concentrate on the schemas of Holons, Meta-systems and Worlds within the overall emergent ontological hierarchy of schema. I have proposed a speculative hierarchy of such schemas which consists of

Pluriverse
 Kosmos
 World
 Domain
 Archon (Meta-system)
 Holon (Special Systems)
 System
 Form
 Pattern

¹³⁷ ISSS 2000 Toronto

Monad

Facet

In the face of this ontologically emergent hierarchy I would have to rephrase my definition of spirituality to talk about "schemalessness" rather than just formlessness. Formlessness is readily understood by everyone, but all the schemas as templates of understanding apply some constructed or invented ordering to the ontic realm. We can think of the ontic realm of physis as a kind of magma that we slip our categorizations over by a kind of projection. The schemas live in the realm of logos. Science relates the schemas of the logos to the material of the physis through the nomos of ordering. Schemas take mathematical categories and render them by analogy into something that may be applied generally to the physis. But in our theory of worlds we suggest that the schemas be disengaged from the physis and studied in their own right in order to understand them better. We suffer from the mistaken impression that the schemas come from the physis and we are discovering "systems" out there in nature. When in reality we are projecting these schemas onto the magma of the ontic. The ontic has its own separate emergent levels that resist reduction. That gives us the hierarchy of quarks, particles, atoms, molecules, cells, organisms, society and Gaia. But the schemas have to resist not reductionism but instead skepticism. It is skepticism concerning the application of a particular schema to a particular phenomena. If people are talking about the same phenomena in terms of different schemas then they cannot understand each other. This is because they are using different root analogies and the phenomena will appear differently based on what root analogy one uses to attempt to understand it. To understand the schemas we must attempt to do an archeology of knowledge on our tradition to find the schemas which have been developed over the centuries and to understand their relations to each other. What we find when we do that is that the schemas have all kinds of interesting holonomic properties in relation to each other. We need to understand those dualities because they strengthen our comprehension of the phenomena because we will know what comes with the projection of the schemas and what are the aspects related only to the phenomena. General Schemas Theory has the task of studying the schemas, like for instance General Systems Theory or General Meta-Systems Theory, which science in general are unconscious of and attempting to understand the general properties of these schemas outside the application to any particular domain or discipline. We understand that the Domain itself is a schema which has particular properties of its own. The university is a conglomerate of specialist disciplines or domains. This is what causes nihilism, i.e. the splitting of the perspectives on the phenomena. Within our science there are various emergent levels of the processing of information by the group and the individual. This gives us another dual hierarchy that connects the metaphysical principle to the limited phenomena of the physis and logos.

Absolute = metaphysical principle

actualization

Existence

insight

Ontos

wisdom

Episteme
knowledge
 Paradigm
information
 Theory
data
 Facticity
given
 Suchness = finite phenomena

This interleaving of the individual's levels of knowledge with the levels of the social organization of knowledge that undergo emergent changes allows us to span the distance between the meta -physical principle and the finitude of the realm of physis and logos which each are in turn articulated by the ontic and ontological emergent hierarchies. In our Theory of Worlds we suggest that the projection of the schemas on the magma of the ontic be suspended. We also suggest that the inspissation of Being into the phenomenal beings be suspended. When this suspension is effected then we find ourselves within the chain of Being which is set of unfolding a dualistic bifurcations which has the following form.

Particle	<i>Uncertain Complementarity</i>	Wave
Quantum Mechanics	<i>Spacetime</i>	Relativity
Physics	<i>InfoEnergy</i>	Thermodynamics
Physis	<i>Orders</i>	Logos
Limited	<i>Rights</i>	Unlimited
Have	<i>Goods</i>	Have not
Exist	<i>Fates</i>	Exist not
Actualize (paradoxicality)	<i>Sources</i>	Actualize not (supra-rationality)
Unmanifest = Extremal ¹³⁸	<i>Root (Single Source)</i>	Manifestation ¹³⁹

Within the dualisms produced by our social construction or invention of the world there are a series of non -duals at each level of dualistic unfolding. This successive symmetry breaking is the fundamental basis for the emergent generation of the schemas within the logos, and the emergent differentiation of the phenomena within the physis. If we suspend the principle of excluded middle and its dual the principle of non -contradiction then we are able to see the non -duals and trace them back to their root which is the single source of causation, which is the basis of what Jung calls synchronicity. At that root we find the basis of genuine spirituality or soulfulness which is not just beyond the "Form" or the other schemas but is also beyond the dualistic splitting that produces our world. To

¹³⁸ The Extremal is the mixture of Paradoxicality and SupraRationality. It is the antipode to Manifestation. See "Autopoietic Meta-theory: Paradox and Supra-rationality" at <http://dialog.net:85/homepage/autopoiesis.html>

¹³⁹ Manifestation is the deepest level of disclosure beyond Existence and Being. It is non-dual between Existence and Being. See An Approach Toward Being, Existence and Manifestation at <http://dialog.net:85/homepage/fe00v01.pdf>

get to that level we must pass our of Being into Existence and on to Manifestation which is the non-dual between Existence and Being.

BUDDHISM, SUFISM, TAOISM AND PLATO'S DIVIDED LINE

We take three traditions as exemplary of the schemalessness and even nonduality, i.e. dualistic bifurcationlessness. These are Chinese and Indian Buddhism, Chinese Taoism and Islamic Sufism. Each of these in their own way take us out of Being into existence or manifestation. We believe that these three traditions have different goals and that they are not routes all leading to the same place as Perennialist approaches to spirituality or soulfulness suggest. We will attempt to explain these different goals based on Plato's divided line analogy. In most interpretations of the divided line the *lines* themselves are not given any meaning. Here we will give the lines themselves meaning as a way to understand the various goals of Buddhism, Taoism and Sufism.

Glaucon said, with a ludicrous earnestness: By the light of heaven, how amazing!

Yes, I said, and the exaggeration may be set down to you; for you made me utter my fancies.

And pray continue to utter them; at any rate let us hear if there is anything more to be said about the similitude of the sun.

Yes, I said, there is a great deal more.

Then omit nothing, however slight.

I will do my best, I said; but I should think that a great deal will have to be omitted.

You have to imagine, then, that there are two ruling powers, and that one of them is set over the intellectual world, the other over the visible. I do not say heaven, lest you should fancy that I am playing upon the name ('ourhanoz, orhatoz'). May I suppose that you have this distinction of the visible and intelligible fixed in your mind?

I have.

Now take a line which has been cut into two unequal parts, and divide each of them again in the same proportion, and suppose the two main divisions to answer, one to the visible and the other to the intelligible, and then compare the subdivisions in respect of their clearness and want of clearness, and you will find that the first section in the sphere of the visible consists of images. And by images I mean, in the first place, shadows, and in the second place, reflections in water and in solid, smooth and polished bodies and the like: Do you understand?

Yes, I understand.

Imagine, now, the other section, of which this is only the resemblance, to include the animals which we see, and everything that grows or is made.

Very good.

Would you not admit that both the sections of this division have different degrees of truth, and that the copy is to the original as the sphere of opinion is to the sphere of knowledge?

Most undoubtedly.

Next proceed to consider the manner in which the sphere of the intellectual is to be divided.

In what manner?

Thus: --There are two subdivisions, in the lower or which the soul uses the figures given by the former division as images; the enquiry can only be hypothetical, and instead of going upwards to a principle descends to the other end; in the higher of the two, the soul passes out of hypotheses, and goes up to a principle which is above hypotheses, making no use of images as in the former case, but proceeding only in and through the ideas themselves.

I do not quite understand your meaning, he said.

Then I will try again; you will understand me better when I have made some preliminary remarks. You are aware that students of geometry, arithmetic, and the kindred sciences assume the odd and the even and the figures and three kinds of angles and the like in their several branches of science; these are their hypotheses, which they and everybody are supposed to know, and therefore they do not deign to give any account of them either to themselves or others; but they begin with them, and go on until they arrive at last, and in a consistent manner, at their conclusion?

Yes, he said, I know.

And do you not know also that although they make use of the visible forms and reason about them, they are thinking not of these, but of the ideals which they resemble; not of the figures which they draw, but of the absolute square and the absolute diameter, and so on --the forms which they draw or make, and which have shadows and reflections in water of their own, are converted by them into images, but they are really seeking to behold the things themselves, which can only be seen with the eye of the mind?

That is true.

And of this kind I spoke as the intelligible, although in the search after it the soul is compelled to use hypotheses; not ascending to a first principle, because she is unable to rise above the region of hypothesis, but employing the objects of which the shadows below are resemblances in their turn as images, they having in relation to the shadows and reflections of them a greater distinctness, and therefore a higher value.

I understand, he said, that you are speaking of the province of geometry and the sister arts.

And when I speak of the other division of the intelligible, you will understand me to speak of that other sort of knowledge which reason herself attains by the power of dialectic, using the hypotheses not as first principles, but only as hypotheses --that is to say, as steps and points of departure into a world which is above hypotheses, in order that she may soar beyond them to the first principle of the whole; and clinging to this and then to that which depends on this, by successive steps she descends again without the aid of any sensible object, from ideas, through ideas, and in ideas she ends.

I understand you, he replied; not perfectly, for you seem to me to be describing a task which is really tremendous; but, at any rate, I understand you to say that knowledge and being, which the science of dialectic contemplates, are clearer than the notions of the arts, as they are termed, which proceed from hypotheses only: these are also contemplated by the understanding, and not by the senses: yet, because they start from hypotheses and do not ascend to a principle, those who contemplate them appear to you not to exercise the higher reason upon them, although when a first principle is added to them they are cognizable by the higher reason. And the habit which is concerned with geometry and the cognate sciences I suppose that you would term

understanding and not reason, as being intermediate between opinion and reason.

You have quite conceived my meaning, I said; and now, corresponding to these four divisions, let there be four faculties in the soul-reason answering to the highest, understanding to the second, faith (or conviction) to the third, and perception of shadows to the last-and let there be a scale of them, and let us suppose that the several faculties have clearness in the same degree that their objects have truth.

*I understand, he replied, and give my assent, and accept your arrangement.*¹⁴⁰

The divided line analogy allows us the division into four parts:

Principle Hypothesis Right opinion Unfounded opinion
Soul-reason |E/ Understanding |M/ conviction |V/ appearances of perception

Where E = Emptiness of Inward Existence

M =Manifestation

V= Void of Outward Existence

Soul-reason deals with non-representable intelligibles, i.e. principles, while hypothetical understanding deals with representable intelligibles, i.e. hypothesis, such as we find in geometrical proof. Conviction or faith deals with those things that are taken as true or real, which have been tested by experience forming the basis of true or real opinion whereas the realm of appearances themselves have not been tested and thus may appear to be anything such as a rope that appears to be a snake which has no basis and therefore leads to unfounded opinion. On the other hand the non-representable intelligibles are things like the idea of the Good. What we see in the divided line is a general movement from phenomenal embodiment toward the realm of schemalessness and nonduality. It is several stages of purification that Socrates feels is necessary when moving from the physis to the logos.

We will look at the divided line in a different way which will help us understand the difference between Taoism and Buddhism first and then Sufism. First let us look at the difference between representable and non-representable intelligibilities. If we consider the non-duals then Order and Right are representable while Good and Fate are non-representable. Generally as we move downward through the non-duals they become more and more non-representable. On the other hand let's look at the aspects of Being, i.e. true, real, identical and presence, which all have opposites. We ascribe Presence and Identity to perceptual appearance and Reality and Truth to conviction. This means the opposites are ascribed to the opposite section of the divided line in each case. This gives us the following formation:

A	B	C	D
<u>soul-reason</u> <u>principle</u>	<u>Understanding</u> <u>hypothesis</u>	<u>Conviction</u> <u>Correct Opinion</u>	<u>Perception</u> <u>Unfounded Opinion</u>

¹⁴⁰ Benjamin Jowett translation

Good	Spacetime	True	False
Fate	Infoenergy	Absent	Present
Sources	Order	Real	Illusory
Root	Right	Different	Identical

Thus we can see that the divided line connects yet keeps apart the non-duals and the aspects of Being. Generally major division between B and C separates the physis from the logos. The division between A and B separates the representations we have internally from those things that are schemaless that have no representation. The division between C and D separates those things that can be verified and validated from that which has not been purified by any sort of testing. What is interesting is the concept that what arises from A is what comes to us from beyond ourselves from within while what arises from D is what comes to us from beyond ourselves from the outside. Thus B and C are the region of the ego while in Jungian terms ABCD is the region of the Self. In other words the self is the totality of what appears even from beyond the self inwardly or outwardly while the ego is that is representable and testable so as to forge a unity as the center of consciousness.

Now we will be bold and assert that the minor line between A and B stands for inward existence while the minor line between C and D stands for outward existence while the major line between B and C stands for manifestation. In other words we will use the divided line of Plato as the basis for searching for the non-duals between each of his named divisions. We posit that Buddhism interprets inward existence as emptiness and would reduce the entire phase space of the line divided into two phases A and BCD. Above we have labeled this line as E for the Emptiness of Inward Existence. We posit that Taoism interprets outward existence as void and would reduce the entire phase space of the line divided into two phases BCD and A. Above we have labeled this line as V for the Void of Outward Existence. Both of these reductions destroys the interior phase space of the ego within the self. The analogy for Inward Existence used over and over again by the Buddhists is Gold. Gold has the feature that when purified that it is imperishable. Thus the Buddhists think of the suchness of Inward Existence as being like Gold. All we need to do is look at the [Awakening of Faith](#) to understand that the Tathagata Gharba¹⁴¹ is a region of imperviousness which has a characteristic similar to gold but with respect to consciousness. The Taoists on the other hand value Jade which is a stone which is full of detailed patterning and which is strong enough to be carveable. The nature of Outward Existence is like Jade rather than Gold. The Taoists are overwhelmed by Nature which is from beyond the self coming from the outside. The Buddhists on the other hand are overwhelmed by the Schemalessness which comes from the "formlessness" within consciousness. Both of these sources of inundation breakdown the region of the ego within the self which they see as a false unity. The Self has a pre-synthesis that is a priori to experience. An even greater pre-synthesis is that of the Atman which is an intersubjective synthesis prior to experience. Both Buddhism and Taoism would immerse themselves in these pre-syntheses. However, Buddhism emphasizes the Sanga, or community of monks, while the Taoists emphasize the pre-synthesis of all of nature.

¹⁴¹ Womb of Thus-come, a name for the Buddha

When we look at Chinese paintings we see the little man hidden in the voluminous landscape. That little man is the one who is overwhelmed by Outward Existence and who lives as a hermit in those wilds. The reduction to inward existence is very different from the reduction to outward existence, even though their effects in terms of effacing the self is similar. Thus, the emptiness of the self -nature of Buddhism is different from the Void of Nature which includes the self of Taoism. These are two paths with different goals even though the destruction of the ego in favor of the pre-synthesis of the Self and Atman are similar in both.

ASPECTS AND NON-DUALS WITHIN THE KINDS OF BEING

Sufism strives for an even deeper non-dual which breaks the phase space into two sections AB and CD. Beyond the Gold of Inward Existence is the Platinum of Manifestation. Beyond the Jade of Outward Existence is the Diamond of Manifestation. Manifestation is the non-dual between Being, i.e. the content of the sections of the divided line, and Existence, i.e. what lies beyond Being, at the fifth meta-level of Being and beyond. Being has four kinds, i.e. Pure, Process, Hyper and Wild. Thus it is necessary to take the determinate divided line through all of these meta-levels of Being until we reach the ultra level of existence.

	ULTRA existence	WILD Being ⁴	HYER Being ³	PROCESS Being ²	PURE Being ¹
ORDER	indeterminate	propensity	possibility	probability	determinate
ORDER	discontinuous	chaotic	fuzzy	stochastic	continuous
RIGHT	asymmetry	singularity	Symmetry breaking	groups	symmetry
GOOD	Indifference, singleness	unique	differAnce	Difference that makes a difference	pure difference
FATE	Simultaneous y freedom and determination	Special determination of freedom	Undecidability of determination or freedom	Unfolding freedom or determination	Pure freedom or pure determination
SOURCE	From one viewpoint it exists from another viewpoint it does not exist	Both arising and departing	Neither arising nor departing	Arising or departing	Unmixed and unadulterated , i.e only arising or departing.
ROOT	Single source of causation or correlation	Break up of the single source into indeterminate causation, Wild indeterminate causation or correlation	Undecidability of causation between causes or correlations	Correlation	Determinate causes.

A similar thing occurs with the Aspects of being which must also be taken up through the meta-levels of Being:

Aspects verses Kinds of Being	Pure Being¹	Process Being²	Hyper Being³	Wild Being⁴	Ultra Existence
Truth	Pure Truth	Process Truth	Hyper Truth	Wild Truth	Ultra Truth
Identity	Pure Identity	Process Identity	Hyper Identity	Wild Identity	Ultra Identity
Reality	Pure Reality	Process Reality	Hyper Reality	Wild Reality	Ultra Reality
Presence	Pure Presence	Process Presence	Hyper Presence	Wild Presence	Ultra Presence

This fact that each aspect transforms as we move to higher and higher meta -levels is little appreciated by most philosophers. It means that Being ultimately presents us with a faceted structure where each facet is like a part of a mobile in which all the facets intersect all the others as they move in the mobile.

For instance, Truth at the level of Pure Truth means verification. But it transforms at the next level up into Process Truth which is the Showing and Hiding of unconcealment that brings forth the truth. At the next level up Hyper Truth is what we see when the Unconscious reveals itself. Hyper Truth is the truth that is never manifested but which haunts the truths that are uncovered. Wild Truth is the final level and that appears when we realize that the revealed truth and the secret truth are ultimately the same. After that there is only the emptiness of existence where truth itself becomes an empty construct. Here ultra-truth becomes an indicator pointing at suchness.

If we were to look instead at identity we would see that Pure Identity is what we get in formal systems that have tautologies at their root. Process Identity is the next meta -level up and it is what Heidegger calls the belonging together of Sameness in Identity and Difference. At the next level up we have Hyper Identity which occurs when the undecidable enters the picture. Suddenly identities are ambiguous and multifarious. This is what Derrida calls differance which he explains by way of differing and deferring. It is embodied ambivalence. The final level up is called Wild Identity. We see that in something like Hegel's 'absolute reason' in which the myriad varieties in their concrete details become identical in a sense, this is to say identity within and though difference, i.e. knowledge of the self though the other. Beyond that there is the identity of the sources of difference themselves in existence. At that point ultra -identity becomes empty itself and points to pure suchness.

If we look instead at reality then we see Pure Reality as the product of testing which like verification needs to be repeated often. Process Reality occurs when there is a continual regime of testing that never ends. We find this in some critical professions where they must continually be retrained to continue to hold their certification. Hyper Reality is a

departure at the next higher level of reality where the simulation or test is more real than 'reality' itself. For instance, some simulation environments allow for scenarios that are very unlikely to occur in reality but we can make them happen as if they were real in order to prepare for them. In Hyper Reality the game becomes more real than normal mundane 'reality'. Finally at the last step up there is Wild Reality in which we can no longer discern what is real and what is not real, what is the game and what is reality. Cyberspace as a new medium which uses the Internet as an infra-structure has the nature of Wild Being which spawns a myriad of virtual realities. Beyond that is the ultra-reality of existence itself. Ultra reality is a pointer toward suchness.

If we look at the next aspect then we need to consider Pure Presence. Pure Presence is static and fixed presentation of a product with illusory continuity. Process Presence is the underlying mechanism behind the showing and hiding of the presentation. The process of presentation is called appearance. Hyper Presence is the appearing of the always already hidden as a disruptive force within the presentational process which distorts the final product which is held within the illusory persistence. Wild Presence is when we cannot tell the difference between the things hidden and presencing behind the appearances and the appearances themselves. Beyond that is the realm that is never presented but merely is found lying around ignored which is called existence. Ultra presence is a pointer toward suchness.

All of these facets taken together give us a picture of Being in its totality which is utterly fragmented. We look at these facets as if for the first time and wonder at the complexity of the paradox of Being that our Indo-European ancestors forged. It is this mobile of facets that we find ourselves caught within. The ones that exhibit this encompassing the best are the Analytic Philosophers who are realists obsessed with Truth and Identity because they think reality can be formalized, or at least wish it could. They, of course, reject introspection and phenomenology which concentrated instead on presences. Thus philosophy is divided against itself. Phenomenology develops into ontology of the kinds of Being while Analytic Philosophy stays within the realm of the more orthodox concentration of philosophy on aspects. The kinds of Being are hidden behind the veil of illusory continuity of Pure Identity, Pure Presence, Pure Reality, Pure Truth. It is the heirs of Husserl that break through this veil mostly by way of his recognition of the fundamental difference between simple ideas and essences. By doing that they reveal the transformation of the aspects at the various deeper meta-levels of Being.

It is this new ontology of the fragmentation of Being that we now have to work with in our approach genuine spirituality. This is a theory like the theory of the unconscious which gives us deep insight into the structure of the world. It turns out that the Western world has conserved this underlying structure for thousands of years. If we look back at the Vedas we find it in the differences between the Vedic gods. We find it in various Indo-European mythic traditions. In fact once we start looking for it, through the practice of onto-mythology, it seems to appear everywhere. This is because these four different meta-levels of Being synergize to produce the face of our world to us in concrete phenomena. We can look at these faces of the world in various disciplines and even in our selves as we consider how the facets of Being fragment our lives and the lives of

others. This has to do with manifestation and that effects all disciplines. Manifestation as a whole is fragmented in the Western Worldview. We experience this in our lives and see it in the nihilism all around us. Genuine Spirituality needs to see these structures in the world and in the subjects surrounding us within the world and use this knowledge to help the subjects unify themselves and gain totality and gain wholeness within this fragmented world they inhabit. This basic theory is explicit and well formed. It contains within it something like the unconscious that appears on the third meta-level of Being. But this unconscious is the Essence of Manifestation¹⁴² within Being, not the unconscious of an individual nor society but the unconscious of manifestation within Being itself. The unconscious is basically split between psychological and social unconsciousnesses as has been pointed out in The Production of Desire. But this split unconscious that mutually mirrors each other has an origin in the unconscious of manifestation which is always already lost. We see it in the primal scenes like that of the Well and the Tree of the Indo-Europeans. But more than just a theory similar to that of the unconscious that founded psychology or a theory of alienation from sociology we have a contextual structure that gives the concept of the unconscious of manifestation a structurally articulated situation within which it is expressed. Thus the theory of the fragmentation of the mobile of Being is a much richer and more profound notion than the amorphousness of the unconscious which is a mere absence made present by indications. The theory of kinds and aspects of Being that combine into the facets of Being shows how the Essence of Manifestation plays off of and ultimately becomes an integral part of manifestation at the higher level of Wild Being.

We need to take the divided line through all of the various levels of Being until we reach the bedrock of Existence at meta-level five where we go beyond Being into the unthinkable. The unthinkable is interpreted as Emptiness by the Buddhists and Void by the Taoists. These two sound the same but in actuality they are different since the Buddhist emptiness refers to inward existence and the Taoist Void refers to outward existence. Both effectively reduce the inner B and C phase space of the ego to nothing within the total line divided ABCD. If we want to get to manifestation, i.e. the deeper non-dual which is the object of Sufic practice then we merely need to think of the dualism between Inward and Outward Existence and take that down through the meta-levels as well. Thus instead of dualistically having a separation between these two kinds of existence we begin to see existence as a process, i.e. the process of actualization. Then we note that there is a undecidability between emptiness or void, a hiatus at which we are neither empty nor void. Finally we note the chiasmic reversibility of the "empty void" and the "void emptiness." There is a slight difference in meaning between these reversed phases. This slight difference defines the pocket of complete nonduality between them in their mutual intaglio. That pocket of nonduality is manifestation which is the non-dual between inward and outward existence. The way the Sufis understand this is by switching from creation to the attributes of the creator. If we consider the realm of otherness which is the mutual alienation and anomie between selves then the realm of manifestation is non-otherness. It is not self and it is not otherness but it is a unique and singular non-other. In this sense God alone has no dual, i.e. is singular and unique. Existence has to do with the creation as seen beyond Being. That is to say Existence is neither true nor false,

¹⁴² Michael Henry

real nor illusory, identical or different, present nor absent. Existence is the opposite of the the quintessence which is both true and false, real and illusory, identical and different, present and absent. The quintessence is the amalgam of all the various moments of the aspects of being which produce the Holoidal which is true, real, identical and present to the Ephemeron which is false, unreal, different and absent with all the combinations in between. There are sixteen moments of Being which are all summed together in the paradoxicality of the quintessence which point toward the wholeness of the Atman. Quintessence is paradoxical while Existence is supra-rational. What is rational is between these extremes. In the West we are obsessed with paradox. Note the celebration of paradox in Hoffstadter's Godel, Escher and Bach. But the supra-rationality of existence is hidden from us by the underlying assumption of excluded middle. Indian Buddhist logic violates this taboo and establishes with Nagarjuna that Emptiness is the unthinkability of the difference between the neither ...nor and the both ...and. Thus Manifestation is the midpoint between paradox and empty/void existence, and more deeply it is the non-dual between emptiness and the void as well. We zero in on manifestation by following the chain of nonduality between the duals. It is the interspace and barrier between Existence and Being but it is further the interspace and barrier between Emptiness as Inward Existence and the void of Outward Existence. It can be thought of as the rare Platinum which is beyond Gold and Silver, the royal metals. Some alchemists hypothesized that there was a metal beyond gold which was the basis of raising the other base metals to the level of Gold. Platinum is so rare that it was not known until very recently. It is heavier than gold and of silverish hue and thus it is in some sense between them. It acts as a catalyst. Similarly Jade is a very special kind of crystalline structure that has beautiful patterning and will hold a carving. But diamond is the ultimate crystal lattice which is the hardest of all substances. Manifestation is like Diamond in relation to the Jade crystals, and like Platinum in relation to the royal metals of Silver and Gold. At the point of manifestation one changes one's gaze from the found creatures to the attributes of the creator who is non-other¹⁴³. From those attributes one seeks also to understand the non-dual core which is called the Godhead¹⁴⁴, which is a desert of namelessness and attributelessness that Meister Eckhart talks about so eloquently.

If we want to look for examples we find the poetry of Stonehouse compelling. He was a Zen monk with taoist inclinations. He says:

*There's a road to the west that nobody takes
people want out but hell has no gate
jeweled pavilions and terraces are empty
cauldrons and ovens are full*

*Look for the real and it becomes more distant
try to end delusions and they just increase
followers of the way have a place that stays serene
when the moon is in the sky its reflection is in the waves*

*Trying to become a Buddha is easy
but ending delusions is hard*

¹⁴³ "There is no god, only Allah" is the axiom of Islam.

¹⁴⁴ In Arabic 'Dhat.'

*how many frosty moonlit nights
have i sat and felt the cold before dawn*

*Stripped of conditions my mind is blank
emptied of existence my nature is bare
often at night my windows turn white
the moon and the stream visit my door*

*Work with no mind and all works stops
no more passion or sorrow
but don't think no mind means you're done
the thought of no-mind still remains*

*No mind in my work the wind through the trees
no work in my mind the moon through space
windsound and moonlight wear away
one layer then another*

*The new year comes and the old year goes
the fourth tomorrow the third today
still unenlightened i have aged in vain
where in the world can I express my shame¹⁴⁵*

Here Stonehouse expresses his attainment of the Gold and the Jade together in conjunction. And still he does not count that as enlightenment, because he senses that there may be an even deeper non-dual.

THE INNER STRUCTURE OF EXISTENCE AND SPECIAL SYSTEMS THEORY

All this talk of the spiritual, i.e. what is beyond schemas, beyond the splitting of the dualisms that underlie the world, beyond the aspects and kinds of Being, beyond even the non-duals at the heart of our worldview prepares us to think more clearly about the schemas themselves. What we have noted before and will note again is that there is a crucial difference between the meta -system schema and the system schema. The system is a gestalt or a flow or a combination thereof. A meta -system is a proto-gestalt or proto-flow or a combination thereof. The proto -gestalt is the background of the gestalt just as the proto -flow is the background of the flow. The proto -gestalt or proto -flow has what David Bohm calls Implicate Order which is the dual of the Explicit order of the system. What we note is that a systemic gestalt is a whole greater than the sum of its parts while the meta-systemic proto-gestalt is a whole less than the sum of its parts. This brings us to wonder if there is any kind of whole that is precisely the same as the sum of its parts with no surplus or deficit. It turns out that such wholes exist and we call them holons after the usage established by Koestler. Holons are both wholes and parts simultaneously like our organs with our bodies. It turns out that there are three holonic special systems which are called Dissipative Ordering, Autopoietic Self-organizing, and Reflexive Social. These are defined in terms of the Hyper Complex Algebras where the System is related to the real algebra, the Dissipative System is related to the complex algebra which adds conjunction, the Autopoietic System is related to the quaternion algebra which loses the commutative

¹⁴⁵ The Zen Works of Stonehouse by Red Pine (Mercury House San Francisco 1999) pages 51-53

property, the Reflexive System is related to the octonion algebra which loses the associative property and the Meta -system is related to the sedenion non -division algebra and those above it. Holonic Special Systems are at the same time partial systems and partial meta -systemic fields. Meta -systems can be called environments, ecosystems, ecologies, situations, contexts or milieus. They are the dual of the super -system which is a nested hierarchy of systems within systems within systems, or what is called a system of systems. The meta -system is a deconstruction of the super -system into the field that supports the sub-systems within the super-system.

We posit that the nature of the holonic special systems is a model of existence rather than Being. However, we note that the kinds of Being delineate these kinds of existence.

Kinds of Being	Emergent Systemic Levels
	System = thermodynamic-living-social gestalt or flow
Pure Being	
	Holonic Dissipative Special System = Thermodynamic
Process Being	
	Holonic Autopoietic Special System = Living
Hyper Being	
	Holonic Reflexive Special System = Social
Wild Being	
	Meta-system = proto-gestalt or proto-flow

This is the way that Existence defines Being and vice versa. The meta -levels of Being define the special systems and the special systems define the meta-levels of Being. In this way duality and nonduality define each other as we see in mobius strips and kleinian bottles the anomalous non -orientable surfaces in topology. Existence and Being are complementary duals of each other while manifestation is Self dual. Existence is supra -rational comprehended only by the heart while Being is Paradoxical pushing reason into chaos. Existence is non -dual while Being is dualistic. But there is a deeper non -dual beyond Inward and Outward existence called manifestation. In manifestation reason is maintained neither going to the extreme of paradoxicality or the extreme of supra -rationality. This is similar to the position of Dzong Ka Ba, the Tibetan Buddhist philosopher, who maintains that emptiness and reason are compatible even within the bounds of the acceptance of excluded middle.

When the Buddha achieved enlightenment we posit that he discovered the ground of Existence beyond Being. His discovery was powerful because he exited from the Indo -European worldview which is saturated with Being into the realm of Empty Existence. However due to the idealistic prejudices of the Indian culture this resolution was different from the Void discovered by the Chinese Taoists. In China the indigenous view of existence as Void came into contact with the Buddhist concept of Emptiness. At first the Chinese thought that Buddhism and Taoism were the same. But eventually their appreciation of the difference of Buddhism and Taoism was refined until with

Stonehouse we see both of them at the same time held in conjunction as *empty void or void emptiness*.

*Stripped of conditions my mind is blank
emptied of existence my nature is bare
often at night my windows turn white
the moon and the stream visit my door*

*Work with no mind and all works stops
no more passion or sorrow
but don't think no mind means you're done
the thought of no-mind still remains*

*No mind in my work the wind through the trees
no work in my mind the moon through space
windsound and moonlight wear away
one layer then another*

If we look at Buddhism and Taoism as well as Sufism for evidence of knowledge of the Special Systems we find it in the insistence on achieving balance between surplus and deficit. Under the Bodhi tree the Buddha discovered the bedrock of existence which is structured in terms of the holonomic special systems. The Taoists as well discovered these special forms which are embedded in the void. The void or emptiness is not completely empty of schemas, but instead has the schemas of the special systems embedded within it. It is because of that embedding of this special kind of ordering that normal schemas can spring spontaneously from the emptiness or void. If we look at Buddhism then the three jewels are Dharma Buddha and Sahgha. These correspond to the special systems where the Dharma is a Dissipative Order that is expressed as a doctrine. The Buddha is that doctrine embodied and thus is Autopoietic, i.e. he becomes impervious to the chain of causation called Samsara and achieves nirvana. The Sangha is the brotherhood of monks who have left home and reflect each other providing the continuity of teaching in the Buddhist tradition. Thus the three jewels are the embodiment of the Holonic special systems formations by human beings which live in the emptiness of existence. If we look at Taoism the picture is less clear, but we note that there is a relation between Yin and Yang which together form the Great Ultimate. That relation between Yin and Yang is produced based on their conjunction as we see in the trigrams and hexagrams of the I Ching. We can think of this progressive bisection of the yin/yang combinations at the various heuristic levels as an image of the bifurcation of the Hyper Complex Algebras via the Cayley-Dickson process. At each heuristic level the differentiation of Yin and Yang is merely a mirror of the Great Ultimate which is their source. In Taoism one is engulfed by nature as it expresses the dance of yin and yang in creation. The Confucian sage sits at the middle of the human world and contemplates how he is determined by it but is inwardly non-determinate. The Taoist sage sits in the middle of nature as a whole and realizes his unity with it, i.e. how he is determined by it even though he is himself indeterminate. The sufic practitioner who has his eye on the attributes of God does the same thing with respect to the Creator who goes beyond creation yet is closer to one than creation. In Islam the structure of the sunnah and sharia

of the Prophet Muhammad ¹⁴⁶ has this same holonic structuring based on the special systems. In fact there is a belief in Islam that all the Prophets pointed to this same ground in different ways when they established their individual Sharias (i.e. presence and identity, good and order) as opposed to the Haqqiqat (i.e. the reality and truth, right and fate or debt) which is the same for all the prophets. It is fascinating that the aspects and non-duals are mixed together in the meanings of Sharia and Haqqiqat¹⁴⁷. The point is that the sunnah and sharia of the Prophet Muhammad ¹⁴⁸ is the most complete embodiment of the special systems formations of either of the other traditions. However, we can recognize in both Buddhism and Taoism previous embodiments which maybe have some sort of prophetic origin. In China the prophet might have been Fu Hsi who might be Dhul Karnin in the Quran. Whether the Buddha was a prophet or not is unknown as he was silent on any of the meta-physical antinomies that he was asked, and thus was silent on the existence of God. The point is not so much that they were perhaps prophets, but more that each of these spiritual disciplines have different endpoints, i.e. goals, but all of them in one way or another exemplify the special systems formation which is the structure of empty or void existence and beyond that of the deeper non-dual of manifestation.

Understanding the non-dual holons and their structure allows us to comprehend the schemas that the interpenetration of all things in the empty void takes. The special systems when combined with the system gives rise to the Emergent Meta-system which is a model of the dynamic by which the meta-system arises from the combination of the holons with the system. With the Emergent Meta-system systems arise from the void emptiness and return to the empty void. The meta-system as described by the non-dual division hyper complex algebras gives us a picture of the jeweled net of interpenetration. Out of that jeweled net because of its internal ordering based on the special systems there arises gestalts or systems through the mediation of the Holonic special systems. This is the dynamism of Existence which is normally suppressed beneath the projection of Being. These traditions use this structure as the basis of their modeling of the relation between emptiness or void and creation. As the Taoists say in the Tao Te Ching all things spring from the gateway of the mysterious female. The mysterious female is the Void achieved through non-action. That void gives rise to everything. You do not have to do anything or produce anything, all things are already produced out of the void spontaneously without our intervention. The Buddhists go so far as to deny production or destruction. In other words they deny that anything other than the emptiness actually exists because they are intent on focusing on inward existence which does not need the production or destruction of the outward world. Taoists on the other hand find their home embedded in the void of the Outward Existence. Islamic Sufism concentrates on the non-dual between these two non-duals of void and emptiness. Manifestation is a fullness that fills the void emptiness or the empty void. As Sidi Ali al-Jamal says in his book *The Meaning of Man* . . .

Know that existence is filled. It is never empty. Whoever wants to empty it or says that it is empty, he is ignorant. Allah made its filling vary between senses and meaning. What increases the senses, decreases the meaning. What increases the meaning decreases the senses. Existence is always filled by the sense and the meaning. Had you scrutinized all existence, you would not find the weight of a mustard-seed empty of

¹⁴⁶ Peace and Blessings of Allah be upon him

¹⁴⁷ See Lane's Lexicon of the Arabic Language

¹⁴⁸ Peace and Blessings of Allah be upon him

senses or meaning. This analogy is only understood by the one who plunges into the sea of meanings. May Allah have mercy on ash-Shitri when he said:

*Do not look at the vessels.
Dive into the sea of meanings.
Perhaps you will see Me
In the company of the Sufis.*

Whoever wants the meanings must destroy the senses. Whoever wants the senses, must destroy the meanings. The senses are separation and the meanings are gatheredness. The meaning does not come to the senses, except by that the senses leave, and the senses do not come to the meaning, but that the meaning leaves. Existence is filled between them always either by this one or that one. Emptiness is impossible.¹⁴⁹

CONCLUSION

The holonic schema nestled as the non-dual between the System and the Meta-system is the model for existence which is the complementary opposite of Being. Unless we recognize the nature of Being and find our way out of its fragmentation into Existence we can never know of the deeper non-dual between them of manifestation. Special Systems Theory and the Theory of the Emergent Meta-systems is a route toward this understanding which allows us to appreciate the nature of genuine spirituality. Genuine spirituality goes beyond all the schemas, but there are also special hidden schemas that point directly to the nature of existence which is structured differently than Being. Between these two structures one implicit in the emptiness or void and the other explicit in Being we get a glimpse of the truly non-dual formlessness of manifestation.

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Kent Palmer is a Principle Systems Engineer at a major Aerospace Systems Company. He has a Ph.D. in Sociology concentrating on Philosophy of Science from the London School of Economics and a B.Sc. in Sociology from the University of Kansas. His dissertation on The Structure of Theoretical Systems in Relation to Emergence¹⁵⁰ focused on how new things come into existence within the Western Philosophical and Scientific worldview. He has written extensively on the roots of the Western Worldview in his electronic book The Fragmentation of Being and the Path Beyond the Void¹⁵¹. He had at least seventeen years experience¹⁵² in Software Engineering and Systems Engineering disciplines at major aerospace companies based in Orange County CA. He served several

¹⁴⁹ The Meaning of Man by Sidi Ali Al Jamal (Diwan Press 1977) page 93

¹⁵⁰ <http://server.snni.com:80/~palmer/disab.html> You may also try <http://dialog.net:85/homepage/> or <http://think.net/homepage/> for any of the web related material.

¹⁵¹ <http://server.snni.com:80/~palmer/fbpath.htm>

¹⁵² <http://server.snni.com:80/~palmer/resume.html>

years as the chairman of a Software Engineering Process Group and is now engaged in Systems Engineering Process improvement based on EIA 731 and CMMI. He has presented a tutorial on “Advanced Process Architectures¹⁵³” which concerned engineering wide process improvement including both software and systems engineering. Besides process experience, he has recently been a software team lead on a Satellite Payload project and a systems engineer on a Satellite Ground System project. He has also engaged in independent research in Systems Theory which has resulted in a book of working papers called Reflexive Autopoietic Systems Theory¹⁵⁴. A new introduction to this work now exists called Reflexive Autopoietic Dissipative Special Systems Theory¹⁵⁵. He has given a tutorial¹⁵⁶ on “Meta-systems Engineering” to the INCOSE Principles working group. He has written a series on Software Engineering Foundations which are contained in the book Wild Software Meta -systems¹⁵⁷. He now teaches a course in “Software Requirements and Design Methodologies ” at the University California Irvine Extension. He may be reached at palmer@think.net.

¹⁵³ <http://server.snni.com:80/~palmer/advanced.htm>

¹⁵⁴ <http://server.snni.com:80/~palmer/refauto2.htm>

¹⁵⁵ <http://server.snni.com:80/~palmer/autopoiesis.html>

¹⁵⁶ <http://dialog.net:85/homepage/incosewg/index.htm>

¹⁵⁷ <http://server.snni.com:80/~palmer/wsms.htm>

SIG: Living Systems Analysis

ABSTRACT

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PAPER TITLE: Not Written

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Special Systems theory is the first mathematically based theory of life. Briefly it distinguishes between Systems and Meta-systems (ecosystems or environments) and then identifies hidden between them three special systems called dissipative (Prigogine), autopoietic (Maturana & Varela) and reflexive (O'Malley, Sandywell). These three special systems are neg-entropic and ultra-efficacious (ultra-efficient and ultra-effective). Living systems are a composite of these three special systems the middle of which gives static balance by a maintenance of organization by self-production while the other two give dynamic balance. This combination of static and dynamic balance gives living social systems their adaptability and resilience within changing meta-systemic environments. This theory is based on the mathematics of HyperComplex Algebras and has several physical examples of anomalous phenomena to substantiate that such special systems actually exist in nature even at the non-living levels. The existence of Special Systems as holons which exist non-dually between systems and meta-systems gives a completely new theory of living social systems of a classical scientific nature but with many strange and unexpected collaries due to the nature of the underlying mathematical model. Hypercomplex numbers have been known since about 1850 but have never before been articulated as a systems theory and applied to understanding phenomena like neg-entropy, life and sociality. Due to the interesting structure of the mathematical underpinnings of the theory, it is necessary to rethink the structural basis of these phenomena. For instance, Maturana and Varela's theory of autopoiesis has to be completely rethought on the basis of this new mathematical model. The model allows us to understand the emergent steps from anomalous dissipative structures of Prigogine, to living things which are a symbiotic conjunction of two dissipative special systems, and on to the understanding of reflexive special systems which are inherently social as a conjunction of four dissipative special systems or two autopoietic special systems. The combination of these three kinds of special systems with normal open systems give us various formations one of which is the Emergent Meta-system which is an interesting variation on the Genetic Algorithm. The emergent meta-system gives us a dynamic picture of how the special systems interoperate with normal systems to give us a model of meta-systems. This in turn gives us a mathematically founded image of Gaia which is a interpenetrating and dynamic model of various autopoietic social species cooperating together to form a rich environment which is produced by the organisms that it contains. The paper that describes fully these results is at See <http://server.snni.com:80/~palmer/autopoiesis.html>. The paper I would write for your session would be a summary of the argument of this longer paper.

PAPER TITLE: Not Written

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SUMMARY

See Abstract.

Keywords Life Ontology, Holonomics, Meta-Systems, Special Systems

INTRODUCTION

**THIS PAPER WAS NOT BE WRITTEN DUE TO LIMITATIONS SET BY THE
PROGRAM CHAIR.**