

POSSIBLE GROUNDS FOR A REFLEXIVE SOCIOLOGY

A mathematical and ontological basis for a scientific sociology?

*Introduction to the Project of Grounding
Reflexive Sociology in a Reflexive
Autopoietic Dissipative Special Systems
Theory*

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Started 03/01/16; Version 0.11; 03/05/13; rs05v09.doc

Keywords:

Sociology, Reflexive, Reflexive Sociology,
Social Phenomenology, Autopoietic,
Dissipative, Systems Theory, Meta-systems
Theory, Social Theory, Alchemy, Imaginal
Psychology, Archetypal Psychology

Summary:

In this paper¹ we will explore possible mathematical and ontological bases for **reflexive sociology**. The first part of the essay will consider the possible mathematical basis and the second part will attempt to put that into a wider context by discussing an ontological basis for reflexive sociology. The mathematical and ontological bases are complementary and thus support each other in the grounding of reflexive sociology as a mathematically scientific discipline in a sense that has not been achieved before by any of the sub-disciplines of sociology. The purpose of the essay is to call into question the concept of a scientific sociology and its role in transforming our concept of science in general. The dream of a scientific sociology has haunted the discipline since its founding. The realization of that dream has profound implications for the understanding of science itself. Thus this is an essay not just in the social construction of science and technology, but the science of social invention and construction as a reflexive sociological endeavor.

Introduction

By Reflexive Sociology is meant a sociology that takes into account the sociologist producing the theory or social research himself or herself, or of a sociological discipline doing a social study of itself. Reflexive Sociology is about the

¹ The homepage for the paper is at
http://dialog.net:85/kent_palmer.html

ambiguous region in which Sociology folds through itself. At that point it tends to wax philosophical. It tends to lapse into paradox, viscous circles, absurdity and even at times the insanity of the crackpot. Reflexive sociology has been represented during the early nineteen seventies by such figures as Alan Blum, John O'Malley, Barry Sandywell and others who founded the subdiscipline, which is a sort of postmodern philosophizing about the nature of Social Theory. Since that time there has been a steady if small stream of sociological and quasi-philosophical research based on this approach. The author of this paper did his research during this hey day of Reflexive Sociology and then upon receiving a Ph.D. from London School of Economics in Sociology promptly entered the field of Systems and Software Engineering. This was dictated by the economic downturn of the early-eighties and the saturation of educational institutions. But by changing careers I managed to avoid being condemned to the netherworld of the Adjunct Faculty, a social trap that so many of my peers have been caught in. This production of a second class academic citizens by Educational Administrators exploiting a surplus of graduates is a crime in my opinion. It is tantamount to educational institutions turning against their own products, their graduates, and cannibalizing them. This is a scandal of gigantic proportions since it is reported that about 43% of the instructors in colleges and universities belong to this academic underclass. However, this phenomenon is germane to our subject, because it is an example of how the Academic system has turned against itself by exploiting its own graduates. We do not have truth in advertising when we enter educational

institutions that tell us how those same institutions will exploit us once we are educated by them. We pay for the education and then we are in many instances underpaid and not given benefits by those same institutions once we have gained our qualifications. This is a prime example of how a system turns in on itself in a negative reflexive modality, by reifying its relation to students and faculty by career administrators whose only care is the bottom line. The archetypal image that we should associate with this negative reflexive spiral in our academic system is Kronos eating his own children. The crime of the administrators is underwritten by the silence of the tenured professors. In my opinion every talk by a tenured professor should begin by decrying this injustice. Each Professor in a university is teaching many students who will be exploited by some other institution once they receive their degrees. Professors interests in their students should be lifelong not just up until graduation. Professors should not accept the underclass of lecturers who are their counterparts but should support their striving for equal pay and benefits. The same work is being done in both cases. It is an arbitrary and unjust distinction that only has economic justification in terms of cost cutting by the university administration. Universities collude together to create this academic underclass and exploit each other's graduates. Fortunately I avoided that morass myself, but I cannot help but sympathize with those who have been caught in that social sinkhole which gives reality to the question of reflexive operations of social construction of the academic institutions. This is something that we are doing to ourselves by our objectifications of each other separating out

the roles of administrator, student, faculty member and playing them against each other. But having escaped that fate in Academia which represents Logos in our Society I then had to deal with the in many ways deeper problems of Industry which represents Physis² in our society. Pursuing a career in Systems and Software Engineering is a time consuming and deeply engaging endeavor that tends to take one far away from Academic concerns. Industry has its own exploitive and negative aspects that are in many ways more severe than those of Academia. So attempting to pursue a career in industry has its own interesting and engaging characteristics that will keep one occupied.

However, over the years I kept up my interest in Sociological Theory and expanded more in the direction of Philosophy and Systems Theory. However, I always kept in the back of my mind the problem of the grounding of Reflexive Sociology. In the course of my research on advanced systems theory I serendipitously discovered such a basis for grounding reflexive sociology and this paper is an attempt to report those results to the practitioners of the sociological discipline and especially to social theorists who may be struggling with similar problems today. Upon leaving sociology for industry I eventually found a segment within the technological sector in which my skills with regard to social problems might be relevant. That segment is called Process Improvement. It involves attempting to

² <http://www.lns.cornell.edu/spr/2001-09/msg0035799.html> could be transliterated as phusis, or physis.

improve Software and Systems Engineering work processes using the Software Engineering Institute's Capability Maturity Models. Currently I am working on improving the Systems Engineering rating of my company to a maturity level three based on the CMMI model. I have treated my research work in industry as if it were sociological field work and thus have learned quite a bit about industrial sociology and human work processes in the context of socio-technical systems in extremely technical disciplines. Part of my work in this area may be seen in my Advanced Process Architectures tutorial presented at the Software Engineering Process Group Conference. It is sad that there is not more cross pollination between academia and industry in this and other similar areas of mutual concern. Most of the practitioners in this area know nothing of sociology or any other social sciences being for the most part trained as engineers. In the context of this work I have become interested in the relation of Systems Theory *and* Software and Systems Engineering Design Methodologies. This has led to research at the cutting edge of systems theory which is recounted in my book Wild Software Meta-systems³. In order to explain how systems are designed it was necessary to extend General Systems Theory into a new area which considered what are called Meta-sysetms. The work on the relation of Systems to Meta-systems eventually led to understanding what are now called the Special Systems⁴. The culmination of this research appeared in a book called Reflexive Autopoietic Systems Theory⁵.

³ <http://dialog.net:85/apeiron.htm>

⁴ For more papers on this subject see <http://archonic.net>

⁵ See <http://dialog.net:85/apeiron.htm>

Upon completing this work I made presentations at ISSS⁶ 2000 and INCOSE⁷ 2002 in order to make known these discoveries⁸. I thought it wise to also attempt to inform the Social Theory community because this discovery of the Special Systems has implications for Sociology as well. This is why I am presenting a summary of my research at ISTC⁹ 2003. Thus, I speak to you not as an academic sociologist, but instead as a trained sociologist who through circumstances beyond my control has been forced to do twenty years of field work in the high technology aerospace industry. And who has also continued to pursue my research into the philosophical grounds of reflexive sociology as well as doing research into advanced systems theory *and* systems and software design methodologies. The various interests unexpectedly and serendipitously came together in a grand synthesis with the discovery of special systems theory and emergent meta-systems theory in about 1994. The whole thing resulted from an in depth study of Plato that I was doing as part of my work in writing a book about the structure of the Western Worldview called The Fragmentation of Being and the Path Beyond the Void. In that work I was doing a commentary on the Laws of Plato which focused on the various cities in the works of Plato and how they were organized. The Laws of Plato is at once the first Systems Theory book and also perhaps the first Social Theory book. However, it is ignored by most philosophers and political scientists and almost never studied by Sociologists.

⁶ <http://iss.org/>

⁷ <http://incose.org/>

⁸ See <http://archonic.net>

⁹ <http://www.cas.usf.edu/socialtheory/>

However, there are many strange aspects of the Laws especially when compared with the other cities that Plato describes in the Republic and Timaeus. Eventually I recognized these differences as spelling out the relations between the special systems. However, all these pieces did not fall into place at once. Rather this commentary on the Laws provided a background in which other research into Systems Design Methods and Systems Theory played. At the time I had written a paper on Software Design Methods based on the work of George Klir for The International Journal of Systems Science. It summarized the work I had done on Software Design Methods in the previous ten years. One day I realized that there was a relation between what Klir calls the Ordering Lattice which he called a Methodological Distinction and the Hyper Complex Algebras. At that moment the theory of Special Systems was born. To my knowledge no one had previously used the hyper-complex algebras as a basis for a systems theory. The more I delved into this new source for systems theory the more applications I saw for it to various problems I had been studying over the last thirty years. Hyper-complex algebras see little use in science proper, except in String Theory. They are a mathematical curiosity. But when you take them and use them as a template for producing a series of systems theories, then one sees that their odd properties can be very useful in understanding other areas beyond physics. This is what I have been engaged in doing since 1994. After the theory itself was defined fairly well I began looking for historical precedents and the number one precedent in this case is the works of Plato. I believe that his descriptions of cities are a blueprint for understanding the differences

among the special systems. I believe also that ancient civilizations knew about the special systems and put this knowledge to use. They left us artifacts that attempted to embody those structures. But we have forgotten about the existence of the Special Systems and so they come as news to us today, where they should actually be a wisdom carried consciously by our tradition. But somehow our tradition has forgotten about the special systems and so it is up to us to understand them again today in a way that makes sense in the context of modern science. The point is that as Plato knew, they were a way of understanding social systems, as well as other living systems. Plato's work was designed to pass on knowledge of the special systems to us today. But they have failed up to this point because we did not have a proper theoretical context for understanding those works. The object of this paper is to establish that theoretical context and also to look at Plato's examples of the special systems as well as other examples from antiquity. Once you understand the theoretical context then it is possible to read these examples and get a good idea about the nature of these Special Systems and their relation to each other which is called the Emergent Meta-system. I don't think that I have any particular special skills that allowed me to discern this theoretical pattern. It was merely that I was looking at a large cross section of very different problems which from a particular vantage point resolved into a synthesis. That synthesis as I have followed it up has far reaching implications. My main job in this paper is to attempt to show that this synthesis is a bonafied Sociological Theory as well as its other implications. That should not be difficult because it has a component

of reflexive social theory built into the overall theory at the ground level. The difficulty will be to persuade others that this sociological component of the theory is of significance for the discipline of Sociology. When I took Sociology the dream of sociologists was to be considered a bona fide science like physics and biology. That meant having mathematical models. Unfortunately the phenomena we studied did not lend itself to mathematical models in the same way as other more rigorous disciplines. However, in the case of Special Systems theory there is a mathematical component to the theory which could serve as a basis for grounding sociological theory, at least one of the reflexive sort. So what this paper will suggest is that the fools gold for which all sociologists would give their eye teeth might turn out to be real gold after all. Which is to say that there may be a mathematical basis for at least some part of sociological theory. This is of course the strongest claim of this theory and I am sure it will be the one to meet with the most criticism. But unless we attempt to provide candidates to be refuted then we can hardly continue to call ourselves scientists. This then is a theory that is a good candidate for refutation. I invite everyone to take a swing at it, because if this theory is disproven at the very least I will have learned something from this exercise. Otherwise, I will just remain a crackpot without any justification for understanding why this theory is wrong. So hold on to your seats this is likely to be a wild ride, for all of us.

It should be mentioned that I believe that Reflexive Sociology has a dual which is Reflexive Psychology. I take Reflexive Psychology to be a superset of what has been called by Hillman Archetypal

Psychology based on the tradition of Jungian Psychology which is interested in the Collective Unconscious. Of course we are interested in both the Collective Unconscious and its archetypes as well as the collective consciousness explored by a social phenomenology. However, this concept of a Reflexive Psychology being the dual of a Reflexive Sociology will raise some eyebrows. This will be especially true when we mention alchemy following the tradition of Jung in which alchemy is seen as primal psychology. However this is based on the idea that the archetypes are defined by the special systems which is the subject of a different paper. But the basic concept is that archetypes and ideas are duals of each other. Ideas are unites of presences and Archetypes are totalities of absences. Thus, the Ideas that we posit in a scientific sociology or psychology have to be balanced against the archetypes that appear in folk sociologies or psychologies. Here the folk sociologies, perhaps studied by ethnomethodology in some non-discredited form, and the folk psychologies which we see in such phenomena as mentalization are taken into account as the shadows of the restricted economies of the social sciences that appear in the general economies that surround them and govern the intersection of these disciplines. Just as Alchemy is proto-psychology then the Special Systems as they appear in the organization of Plato's cities appears as proto-sociology. In other words in some sense Reflexive Sociology must deal with what has been swept under the carpet by Scientific Sociology because it functions in the interface between the Restricted economy of Science and the netherworld of pseudo-science in the tradition of S.L. Andresky who wrote Social Science as Sorcery.

A Possible Mathematical Basis For Reflexive Sociology

The first thing that needs to be understood is that there is a difference between Systems and Meta-systems. Everything hinges on this distinction. We know what "systems" are presumably because we use the word all the time. But my definition of it is a Social Gestalt. I contrast the perceptual gestalt with what I call the proto-gestalt and I take this distinction at the conceptual level to be the difference between the system and the meta-system. Unfortunately in our culture there is no real concept of the meta-system or the proto-gestalt. So that means that it is necessary to learn to make this crucial distinction. I define the meta-system as the environment, ecosystem, milieu, context, situation, and other similar words that suggest what surrounds the system. I use the term Meta in the sense of 'beyond'. The meta-system is beyond the boundary of the system. A system is a gestalt in the sense of being composed of a tension between figure and ground. We see the system by a series of figure and ground gestalts that pick out the objects that stand in relation to each other in the system. Systems, of course, can be static or dynamic, they can also be open or closed as in the standard definition. The whole problem is where to draw the boundary of the system and I believe that it is socially projected, that is to say socially invented and constructed and maintained. But all boundaries need a context within which they are inscribed and this context is the proto-gestalt. In effect the proto-gestalt is

the implicate order¹⁰ of the various gazes that pick out the gestalts of the system. The proto-gestalt is the context from the horizon beyond which the gaze cannot reach to the central gestalt at any one moment, but the proto-gestalt contains all the gazes at all the gestalts within that horizon. Thus the proto-gestalt encompasses the environment of the system from the horizon of the gazes of the social observers of the system to the boundaries of the system.

But we can also see another level of system within a system. Thus the meta-system also can exist within a system as the environment of a sub-system within that system. So meta-systems exist both inside and outside the boundaries of the system seen as a social gestalt. When I say social gestalt I am assuming either there are multiple agents observing a system or that the same agent observes the system from different viewpoints, and that that agent is broken up into a swarm of sub-agents.

Once you understand that there is a complementary difference between the system and the meta-system (gestalt and proto-gestalt) then the next step is to understand the characterization of these two kinds of system. The system is a whole greater than the sum of its parts. This is the standard definition of the gestalt which we transfer to the system by considering it phenomenologically. But the meta-system is a whole less than the sum of its parts. This is a state of affairs that is almost never considered. An example of a whole less than the sum of its parts is a sponge, i.e. a whole with holes. The emptiness of the holes themselves play a role, this is

something we learn from the Tao Te Ching when it points out the usefulness of the void in a hole in the wholeness of a bowl. It is strange to think about an absence or lack being useful but think of a tunnel through a mountain that trains and cars pass through, that is very useful. So it is that every system has a complementary meta-system composed of niches especially made to hold the systems of a particular type. That meta-system is made up of lacks that accept the surpluses of the systems it encompasses. If you begin looking at the world in terms of meta-systems you will find them everywhere. But this is a way of looking at things that we seldom experience because all our training is to look at systems and to ignore meta-systems.

Once you can see the difference that makes a difference between systems and meta-systems on the conceptual level and gestalts and proto-gestalts on the perceptual level then the next step is to realize that there exists a type of system, a special kind of system, where the whole is exactly equal to the sum of its parts. Now this is the hard part. Because it is difficult for us to conceive of a whole equal to the sum of its parts until we are reminded of the perfect number. The perfect number is a whole equal to the sum of its divisors, exactly equal to its parts. Note that perfect numbers are rare anomalies and so are Special Systems. The question is whether we can isolate a special type of system in existence that is like the perfect number. The perfect number shows up in Euclid's Elements. It was a crucial example of wholeness in the Classical age. However, it has become merely a mathematical oddity in our own times. This is because no systems theory has been developed that

¹⁰ David Bohm, Wholeness and the Implicate Order

emulates the structure of the perfect number. Such a systems theory must occupy the edge between systems greater than the sum of their parts and systems less than the sum of their parts, just as the perfect number as a mathematical anomaly is compared to numbers whose sum of divisors is greater than the number itself, or less than the number itself. Our job here is to attempt to understand whether it is possible to construct such a systems theory that can act as a bridge between the number theory ideal and empirical phenomena that might be described by such a special systems theory.

One way to approach constructing this possible systems theory is to start with Kant's categories of part and whole. They include the dialectically related categories of Plurality, Unity and Totality. From Plurality we can go in the direction of Unity in which there is a center of coherence that interrelates the plurality. Another direction you can go is in the direction of totality that includes everything together despite a lack of integrity. These are two different directions that it is possible to travel away from plurality toward totality and toward unity. Kant presents them as a dialectic, but in fact there is something that is missed by that way of looking at these categories which is the combination between these two directions which does not subsume unity through plurality to totality. In other words there is something that combines both unity and totality and that is wholeness. It is quite intuitive that a whole is a unified totality which is different from either a unity or a totality or a plurality considered separately. Thus wholeness may be considered a non-dual between the orthogonal directions of unity and totality arising from plurality. Such

a whole may be either a whole less than the sum of its parts, like a sponge, or a ecosystem of niches, i.e. a whole of holes *or* a whole greater than the sum of its parts like a gestalt. But these two orthogonal possibilities also have a non-dual which is the whole equal to the sum of its parts. It turns out that there is not just one such possibility but three. For instance, there are not just 'perfect' numbers but also 'amicable' and 'sociable' numbers. Amicable numbers are those in which two numbers divisors add up to each other. These were known since antiquity as well like the perfect numbers and considered an image of symbiosis. The sociable numbers are a series which forms a ring in which one number adds up to the sum of the divisors of the last number in the series and its divisors add up to the sum of the next number in the series. These were discovered at the beginning of the twentieth century. These three kinds of special numbers give us three ways to make a number exactly equal to the sum of its parts. That condition can either be satisfied in the number itself, autonomously, which is very rare. Or it can be satisfied by two numbers for each other called amicable. Or it can be satisfied by a ring of such numbers called sociable. In other words the condition can be satisfied after a delay and through the mediation of other numbers which are different from itself. Now this means that there is a further differentiation of the Whole that is exactly equal to the sum of its parts into three kinds. I have taken the liberty to develop a special systems theory related to each of these possibilities that are presented us by number theory. I call these three possibilities Dissipative Ordering, Autopoietic Symbiotic, and Reflexive Social. In doing so I invoke a specific

theory that is related to each of these Special Systems. The dissipative special system is related to the work of Prigogine who defines dissipative structures as spreading negentropic order in far from equilibrium systems. The autopoietic special system is related to the work of Maturana and Varela on Self-Producing Systems. The reflexive social special system is related to the work of Barry Sandywell and John O'Malley on reflexive social system. I say dissipative ordering so you will know that it is order that is dissipating in a negentropic system. This is to avoid the confusion that the word dissipation on its own produces by suggesting that something is merely fading away as it disperses. Instead in a dissipative ordering system the environment of a different, or no, order is being converted negentropically to the order that is expanding within the special system of this type. Instead of just autopoietic I add the word symbiotic to make it clear that an autopoietic system is not just a unity as Maturana and Varela suggest but is really a conjunction of two dissipative systems in a symbiotic relation. I add the word social to reflexive to distinguish this theory from other reflexive theories that are perhaps not social in their nature. In a straight forward way we can see that the dissipative ordering system is like the perfect number, the autopoietic symbiotic system is like the amicable number, and the reflexive social system is like the sociable number. However, in my presentation I reverse the priority and say that the autopoietic system is like the perfect number and the dissipative system is like the amicable number. This is because in effect the dissipative system is like the number that needs another number to complete itself and the autopoietic system achieves a kind of unity and stability that the

dissipative system does not have. This is because the dissipative system must expand whereas the autopoietic system has a stable boundary. Thus the dissipative system needs the other number of the amicable set to help complete it and is continually moving toward that other number in the amicable set. On the other hand the autopoietic system achieves a kind of autonomy in its self production that gives it a sort of unity which is like the perfect number in spite of its structural duality made up of symbiotic dissipative special systems. So autopoietic systems have organizational unity like the perfect number in spite of their being made up at the structural level of two dissipative systems that are in symbiosis with each other. Further two autopoietic systems conjoined give rise to the reflexive social system. The most sociable number rings have four members and this is a structure somewhat like the reflexive social special system. However, instead of a ring of dissipative systems these may be made up of two pairs of dissipative systems that produce two autopoietic systems in a symbiotic pair. So the analogy with the perfect, amicable, and sociable numbers from number theory is not perfect. But it is a very close analogy to these three kinds of special system which differentiate wholes that are exactly equal to the sum of their parts sometimes after a delay and mediated through other parts.

An example of a theory that approximates this is that of Deleuze and Guattari in Anti-Oedipus. They distinguish the desiring machine, the individual and the socius. The desiring machines are like the dissipative ordering special systems. The individual organism is like the autopoietic symbiotic special system. The socius is like the

reflexive social special system. The whole purpose of Deleuze and Guattari's theory is to break down the individual organism into partial objects and to see those partial objects forming a rhizome that goes beyond the boundary of the individual in the social network, not of individuals but of desiring machines distributed across bodies. For desiring "machines" I would like to substitute the idea from Foucault of "practices," calling them dissipative practices. I would like to identify four types: desiring : avoiding :: disseminating : absorbing. Dissipative ordering special systems may be of these four types. So there is a kind of chemistry of special systems which would conjunct different combinations of these types of dissipative practices to produce different flavors of Autopoietic and Reflexive special systems as higher level constructs within the rhizomatic network of dissipative practices. We would also like to resuscitate the work of Coutu on Tendencies-in-a-situation, or TINSITs, and describe these dissipative practices as different basic kinds of tendency in human situations with regard to the arrangement of partial objects within the rhizomatic network across bodies.

Now the key point is not so much that these kinds of special system can be attached to existing theories of the social unconscious. Rather the key point is that the analogy from number theory is not the only mathematical analogy that is possible to attempt to understand the relations between these special systems and their nature. The next key analogy¹¹ is to topology. We can liken them to a series of surfaces that have

¹¹ For another earlier version of these same ideas see "Deep Mathematics and Emergent Meta-systems Theory" by the author.

the odd property of being non-orientable. These are the Mobius strip, the Kleinian bottle, and what I call the hyper Kleinian bottle. The Mobius strip is a surface with one boundary and one side although it locally appears to have two sides and two boundaries. Thus, there is a seeming local/global paradox with regard to these figures. The dual of this figure is the Penrose triangle made famous by Escher. It appears in his drawing of a continuous waterfall that serves as its own source. Such an illusion is related to the idea of the perpetual motion machine which is found to be impossible in physics due to entropy. However, what has not been seriously considered is the possibility of an endless information machine. Strange attractors seem to play this role. Such an perpetual information machine might take the form of information moving around a Mobius strip. An example of such a formalism is the Laws of Form by G. Spencer Brown in which the Mark is both operator and operand at the same time having one side as noun and the other side as verb. In the Laws of Form there is a rule that wraps the mark around the null or background state which makes the two rules¹² emulate the duality of the mark. The nature of software has many of these attributes. For instance, Leon Osterweil has claimed that software process is also software itself. Many anomalies in software engineering make it clear that these artifacts have some strange properties such as bootstrapping languages that are written in themselves which are similar to those of the Mobius strip, and gives some idea that information machines are different from physical machines in some peculiar ways. It is possible to see dissipative ordering

¹² $[\] = []$; $[\] = \text{null}$

systems on the form of the negentropic structures of Prigogine in these terms. In other words such systems expand spreading their order from a singularity toward their boundary at which conversion of the environmental order occurs. It is as if there were a flow of information from singularity to boundary which was self-perpetuating which feeds off of the disordering of the environment. Overall positive entropy imbalance is maintained but locally there is negative entropy. The surface of the boundary between the positively entropic and the negatively entropic is similar to the non-orientable surface of the Mobius strip. It has similar strange properties. It allows a reflection of the ordering back to the singularity at the core of the dissipative special system in such a way that the waterfall of ordering gives rise to itself continually. There is the same strange disparity between the global appearance of positive entropy increase and the local eddies of negative entropy that make up the dissipative ordering special system. We probably don't understand completely what is going on in detail in these anomalous far from equilibrium systems but it is clear that something strange is happening which allows the appearance of what Kauffman in At Home in the Universe calls "spontaneous creation of order from nowhere."

What is interesting is that these Mobius formations can be glued together topologically to create a higher level formation called the Kleinian Bottle. The analog of the Kleinian Bottle is the Necker cube in the realm of perceptual illusions. The Necker cube is a pair of gestalts that flip back and forth between each other unstably so that we can not hold onto one

or the other indefinitely. There are a whole series of such perceptual illusions that show the instabilities of the gestalt formations of perception, like the image of the old woman and the young girl that appears in most undergraduate textbooks in psychology. Now this higher level formation is produced by conjuncting two Mobius strips of opposite twist. It creates a figure that is like a bottle in which the spout goes back through the side of the bottle to become a spout at the bottom of the bottle. This surface is also non-orientable and thus topologically anomalous. There are two configurations of this figure. One as a bottle and the other as a bifurcated figure "8" tube that is twisted 180 degrees and glued to itself. The Necker Cube and the Kleinian bottle together give us a picture of the autopoietic symbiotic special system. Like the Kleinian bottle it is made by conjuncting two lower level Mobius strips. It appears as a symbiosis of these two lower level systems at the structural level and thus it is like the Necker cube, each dissipative special system pops out as the figure on the ground of the other dissipative special system and we cannot hold the two in a stable formation perceptually. This is because at the organizational level they have fused completely into a higher order non-orientable anomalous form. The Kleinian bottle like the autopoietic system has the appearance of a closed system which is yet open to interference from the environment. This both open and closed at the same time aspect of the autopoietic system is what is specifically referred to in the theory of Maturana and Varela. With the bottle it is ambiguous whether the surface is on the inside or the outside of the bottle. Since the bottle surface passes through itself it is ambiguous whether it is open or closed.

These paired ambiguities operate like the Nekker like qualities of the two dissipative systems at the structural level but as global properties which are balanced against each other at the organizational level. The unity of the self-producing system arises from the fact that its surface, whether inside or outside, whether open or closed is all non-orientable. This means it is like Riemann Spacetime which is globally curved but locally flat. In other words unlike the Mobius strip which is locally two sided and globally one sided there is instead a global coherence and local incoherence. At the structural level this incoherence is between Nekker Cube gestalts playing back and forth freely and unstably. At the organizational level this incoherence is in the ambiguity between inside/outside and closed/open determinations. Locally there is coherence. You appear to be either inside or outside at any one spot on the Kleinian Bottle surface. You can imagine the crossover point where the Kleinian Bottle self-intersects as being open or closed in any one representation. But the illusion and ambiguity at the structural and organizational level take over when we consider the form of the Kleinian Bottle globally. This topological example along with its dual with regard to perceptual anomalies goes a long way in explaining the oddities of the theory of Self Production which was developed by Maturana and Varela. Self production is like the self intersection of the Kleinian Bottle which produces anomalous situations with respect to primary distinctions such as open and closed or inside and outside. These mathematical analogies clarify the issues that seem even stranger when only expressed in terms of abstractions about biological creatures and their subsystems. Maturana

and Varela's theory is like a kind of biological existentialism focused on the individual organism rather than the propagation of the essence species. It has gained some popularity recently because it draws attention to some phenomena that appear in biological systems that are normally difficult to explain, such as the way the neurological system works, or the immune system works, or how the whole organism operates. In fact, we could see the organism as a conjunction of two "openly closed" systems neurological and immunological. The idea of their closure is that you cannot predict what they will do based on behavioristic input because for the most part they are reacting to their own internal state. The problem of the immune system is to recognize its *self*. The problem of the neurological system is to recognize *other* within the waking dreams of a real world that we call consciousness. These two openly closed systems are conjoined to produce an organism in which inside and outside are ambiguous as well as openness and closure. Consciousness spills over ecstatically projected beyond our bodies. We are open to the world while enclosed in our bodies. Structurally we see logos and physis as twin gestalts that are unstable like those in the Nekker cube. Organizationally we realize that we are really composed of mindbody, i.e. a non-orientable interface between body and mind which is non-dual rather than the duality that our culture tends to reinforce. Our unity is the continuity of that non-orientable topology of the manifold that connects physis and logos. But that interface has points of self intersection which we call the ego and the body image. We are continually trying to connect that self-intersection to the globally incoherent whole by unconscious processes. But the

ambiguity of the whole leads to instabilities between conscious and unconscious processes that are continually vying for dominance within the self considered as the totality of the person rather than merely the unity of the ego.

The next stage is the conjunction of two Kleinian bottles into a hyper-Kleinian Bottle. This is constructed by taking a clover leaf tube instead of one shaped like a figure "8" and twisting it 180 degrees and gluing it together. The hyper Kleinian Bottle is two Kleinian bottles with the same self-intersection surface. In such a formation you do not know which bottle you are in when you enter the shared self-intersection shape which in this case is a circle. The two Kleinian Bottles within the Hyper Kleinian Bottle mirror each other. The illusory image of this is the four dimensional tesseract, which is the four dimensional analog of the cube. The tesseract actually exists geometrically but cannot be fully realized in three dimensional space. We see only shadows in three space when we turn the tesseract in four space with respect to the three space slice. These two higher level figures are the analog of the Reflexive Social special system. We can think of them in terms of Marriage, specifically the Jungian concept that comes from Alchemy of the "Mysterium Conjunctus" or Sacred and Mystical Marriage. The Reflexive Social System is a conjunction of two autopoietic organisms, like we have in marriage which is socially sanctioned institution. The reflexive special system is a field which encompasses two conjoined autopoietic systems. There is a closed mirroring in this relationship. That closed mirroring sets up myriad images of the other and self of the form he thinks that she thinks

that he thinks that she thinks that I am such and such. It has been found experimentally that we easily go up to four levels of ramification of this type without losing track but that beyond the fourth level we begin to lose track of our ramified thoughts of the relations between self and other. Our way of handling this sort of thought is called mentalization. With mentalization we construct a model of what the other knows which we act on. It is a folk psychology that projects ourselves into the other and assumes that they have a mind like we have. Mentalization cuts through all the ramified images to produce a social world which is for the most part fairly stable as a basis for social action. It is a miracle that mentalization works so well and it is like an intuitive sense of the thought of the other and our place in those thoughts that we can act in relation to an consider our own thoughts in reference to in order to know who we are in the social field. The social field and the relations between the others in this field is like a four dimensional space of which our consciousness only has a limited three dimensional view. However, by mentalization we seem to know how to navigate that four dimensional space despite our only mentalized shadows of it. Ultimately that social space is like a combination of the collective consciousness and collective unconsciousness. But we only have indirect access to these psychohistoric properties. We have only the regions mutual self intersection to commune with the others. We only have the shadows of mentalized images of the thoughts and knowledge of the others. Thus, we find ourselves in a mirror house which we continually cut through by our mentalizing hypothesis about the knowledge and thoughts of the other. With respect to

another individual we can reduce that mirrorhouse to a closed internally mirroring partition. But when we go beyond the other within the closed relation then we have a much more difficult situation within which to attempt to mentalize. The social fabric itself is in continual flux and the fields of force are continually changing in the wider mirrorhouse of society at large or even in small groups. So the closed relationship such as is constructed by the institution of marriage is an important building block of society. It allows us to experience the Hyper Kleinian Bottle in which non-orientable surfaces intersect at the point where other such surfaces also intersect. It gives us glimpses into the four dimensional world of which we only see shadows on the small scale before opening up all the stops and attempting to comprehend these fantastic landscapes of multiple self-intersection on the large scale. Here there is a sense that we have actually opened to another dimension which has different properties than the normal three dimensional world. We see that social world through a space of mutual self-intersection, which can lead to paradoxical fusion between different autopoietic systems in a reflexive situation, i.e. organisms in a social situation. This possibility of fusion is called the *Mysterium Conjunctus* in Alchemy. It is of course the ideal of love in our society. Locally there is fusion with the other. But globally there is a supra-rational state in which the organisms and their consciousnesses always remain separated and isolated. But that separation and isolation from a different perspective, when the individuals are seen as empty or void can be viewed as interpenetrating. So at the highest level there is a tension between fusion of paradoxicality, vicious circles or

absurdity on the one hand and suprarational interpenetration on the other. In the tesseract as a four dimensional figure we see this kind of synergy that intimates the possibility of interpenetration as the same dots and lines of the tesseract actually produce eight virtual cubes. The four dimensional realm which is ultra efficient is the image of suprarational interpenetration. On the other hand the Hyper Kleinian Bottle which can be extended to have any number of lobes in a 2^n series is the image of the intensification of ambiguity to paradox to viscous circles on to absurdity and even insanity of utter fusion with everyone.

Notice how these topological and perceptual analogies sharpen our concept of what is at stake at each level of conjunction of the lower level formations to build higher level formations of the special systems. The topological analogy gives structure to our expectations about the nature of Special Systems. What then we are doing here is looking at various mathematical anomalies which happen to have a very similar threefold structure and using that structure to give substance to our concept of how special systems are structured. The various analogies are taken from different mathematical arenas but in each case there is an anomalous emergent structure that defines the relations between elements that are conjoined to give more complex levels of structure. Another example of this is the soliton. A soliton is an anomalous wave that does not lose energy to entropy easily. Solitons travel down troughs or channels and appear as humps of water. They can pass through one another without losing energy, or bounce off walls without losing energy. It turns out that there

are solitons which are single waves that act like particles, but there are also "breathers" which is a conjunction of a positive and negative solitons falling into each other. Solitons must move down their channel but breathers are stationary. There are also things called instantatons. These are solitons of potential energy that travel through potential troughs and seem to jump instantaneously from one point in spacetime to another. We hypothesize that there is also a configuration called a super-breather that is a combination of a pair of breathers by intermediary instantatons. Two breathers might then exchange energy and information between each other by exchanging instantatons rather than just having it's instantatons falling into each other as a normal breather does. Notice that this series: soliton, breather, super-breather is produced by conjunction. Notice that each more complex level is emergent having its own special properties. Notice also that the form involved is an anomaly, in this case a physical anomaly rather than a mathematical anomaly. However, this series is interesting to combine in a thought experiment with the Mobius strip, Kleinian bottle, hyper-Kleinian bottle series. The topological series is static while the physical series is dynamic. And amazingly the Mobius strip can be seen as a kind of trough along which solitons could be imagined to move. In fact a single positive soliton on one side of a strip would be a negative soliton on the other side of the strip. We could imagine breathers existing on the surface of a Kleinian bottle. We could further imagine super-breathers communicating between the surfaces of two Kleinian bottles that were joined into a hyper-Kleinian bottle. Super-breathers exchange information and energy instantaneously across spacetime

between breathers. So by the addition of the physical anomalous series we suddenly introduce movement and dynamism to what would have been a static model. Instantatons can exchange infoenergy between separate Kleinian bottles non-ambiguously. With this exchange we can hypothesize that there is the possibility of constructing perpetual information generating machines which have the ability to produce the appearances that we saw in the Penrose Triangle, Necker Cube and Tesseract. In other words the dynamic of information exchange can produce the illusion that is the flip side of the topological series thus tying together these two phenomena. So each set of mathematical anomalies in fact adds to our picture of the structure of the special systems. Rather than independent views we are in fact seeing different complementary aspects of the same model.

When we say that we want to combine the anomalous model of the soliton series with the anomalous model of the Mobius series with each other we need to be more precise about this combination. If we imagine the Mobius strip to be a kind of trough that the soliton may travel within what we notice is that the same soliton is on one side of the Mobius strip a positive soliton (a mound) and on the other side the same soliton is negative (a depression). Thus the mobius strip as the medium for the propagation of the soliton causes the very same configuration to be both positive and negative at the same time without any interference between the two states because it is the Mobius strip that brings the positive and negative aspects together in the same configuration. When we move up to the Kleinian bottle we would see that that

bottle can be seen as a conjunction of mobius strips with opposite twists. Each of these mobius strips can carry combination positive and negative solitons moving around each mobius strip as a trough. Now when we combine the mobius strips to become a Kleinian bottle then a self intersection circle is formed. At this self intersection circle we can imagine the two solitons from each Mobius strip colliding in the self-intersection circle. At that point they may form a breather, which is stationary, at the self intersection circle. Since the Kleinian bottle is analogous to the organism then this soliton breather might be analogous to the organ of the beating heart. Now when we combine two Kleinian bottles with their breathers into a hyper-Kleinian bottle what we would get is a super-breather again at the ambiguous double self-intersection zone of the two Kleinian bottles. This zone is composed of two circles which if independent can define a four dimensional sphere. Or it can be seen as a three dimensional sphere which is the interface between two four dimensional spaces each of which contains one of the hyper-Kleinian bottles. The super-breather at the self-intersection of the two Kleinian bottles in the Hyper-Kleinian bottle may be seen as two hearts beating as one, made possible by the exchange of instantatons between breathers. This state of two hearts beating as one is a definition of resonance synchronicity. It is an image of the result of the *Mysterium Conjunctus*. Notice that the soliton needs a containing trough in order to propagate. When these two troughs are joined they produce a hermetically sealed container. Steve Rosen long ago recognized that the Kleinian bottle is an image of this alchemical container. In alchemy this container is like a bottle which holds the

prima materia as it undergoes the transformational process. What we see here is a story of how the bottle produces along with the soliton infoenergy packets traveling though the Mobius strip step by step produces the more complex configuration of the Kleinian and Hyper-Kleinian bottles with their breathers and super-breathers at the point of self-intersection and other intersection. And these more complex configurations give us models of what might be meant by the *mysterium conjunctus* if we consider that the ring of intersection is like the wedding ring and the super-breather in the zone of self-other intersection is like the resonance and synchronicity between the hearts of the two autopoietic organisms producing a reflexive interaction that is symbiotic not just at the autopoietic level but at the reflexive level as well. In this way it becomes clear how these two mathematical analogies when taken together produce an interesting result that would not be seen if we just applied them separately to defining the Special Systems.

The most important of these varopis analogies for the Special Systems is that of the hyper-complex algebras¹³. These are unique algebras that exist only in four possible configurations as generated by the Cayley Dickson process. These algebras are called Real, Complex, Quaternian, and Octonion algebras. Beyond these all other algebras are non-division algebras, such as the Sedenions. The Real Algebra is the normal one we are used to dealing with and learning in school. In higher mathematics we learn also about the Complex Algebra

¹³ For a more complete presentation see [Reflexive Autopoietic Systems Theory](http://dialog.net:85/apeiron.htm) by the author at <http://dialog.net:85/apeiron.htm>

which is analogous to the Dissipative Ordering Special System. We seldom hear about the Quaternion which is analogous to the Autopoietic Symbiotic Special System or the Octonion Algebra which is analogous to the Reflexive Social Special System. In each of these algebras we lose an algebraic property. When we move from the Real to the Complex algebras we lose the identity of complex conjugate numbers so orthogonal relations between numbers becomes important. Grassmann was the first to explore these kinds of numbers systematically. When we move from Complex to Quaternion we lose the commutative property so action becomes important. When we move from Quaternion to Octonion we lose the associative property so social relations becomes important. When we move from Octonions to Sedenions we lose the Division property and zero divisors appear. These different algebras are all degenerative cases of the Algebra of the Real numbers we all learn in High School. The emergent relations between these algebras are very precisely defined by the lost properties that differentiate them. These lost properties become the basis for differentiating between the different special systems. These differentiations are much more refined and far reaching in their implications than those we have discussed previously. This is because we can imagine a universal algebra based on each of these special algebras that can form the basis of a special systems theory. We can add these differences in the algebras to those already enunciated. When we do that we see that the algebraic model is more complete because it specifies the framing or limiting elements that exist on either side of the set of three special systems. The real algebra corresponds to

the system, i.e. the whole that is greater than the sum of its parts. The sedenion and other higher order non-division algebras represent the meta-system or whole less than the sum of its parts. And the three hypercomplex algebras between real and sedenion, namely, complex, quaternion, and octonion represent the three special systems that exist as versions of wholes exactly equal to the sum of their parts. This is modeled in the relations of the various imaginary numbers to each other in each of these algebras. I suggest looking at mathematical text books and the multiplication tables of the imaginary numbers in each case to see exactly how this works. But each hyper-complex algebra uses sets of imaginaries in relation to each other in order to produce different images of interpenetration. These images of interpenetration show various ways that a whole can be equal to the sum of its parts because the various imaginaries give rise to each other through their interaction. They form what Aczel calls a non-well founded set with intermediary levels between self-references. These various levels of emergent self reference can be likened to a set of mirrorings. Onar Aam pointed out that a complex algebra is like two mirrors facing each other. A quaternion algebra is like three mirrors facing each other. An octonion algebra is like four mirrors facing each other in a tetrahedral formation. Onar Aam produced the first pictures of the equivalent of the Mandelbrot set for Octonions. It has been known for some time that there are quaternion Mandelbrot set equivalents, but Onar Aam showed that the same was true of Octonions algebras. We have referred to these as Aambrot sets which is the next level beyond the Quaterbrot sets. It is very significant that the

Mandelbrot set appears in the complex plane. Each point in the plane has its own escape velocity and that produces the infinitely deep patterning of the Mandelbrot set (the most complex mathematical object known). So it is for the Quaterbrot and Aambrot sets each point in four dimensional space and eight dimensional space has its own escape velocity discovered through iteration which produces a deep trace level pattern within that hyper-complex space. It should also be noted that according to S. Donaldson the fourth dimension also has infinite fake differential topologies unlike the finite topologies of other dimensions. Notice then that the two, four and eight dimensional spaces have this important trace level Mandelbrot patterning but in the fourth dimension, i.e. the dimension of the autopoietic special system there is also infinite differential topological ramification.

When we add this information to our prior topological model we see that topologies open up to metric spaces and metric spaces are measured by algebraic series. The same level that had effective non-duality with the Mobius strip can be conceived as having the orthogonality of the complex plane. That orthogonality is dependent on a fundamental double mirroring that is worked out with the complex algebra. So rotation of the complex plane $[-1 \rightarrow i \rightarrow 1 \rightarrow -i]$ is similar to the non-duality of the non-orientability of the Mobius surface. But a hidden property of the complex plane is the trace level patterning of intensities of lines of flight that occur with repetitions of formula in the complex space. A similar sort of transformation occurs when moving from the Mobius strip to the Kleinian bottle. We get the four dimensional space which is glimpsed at the reflexive level being

produced since the quaternion is the transformational basis of four dimensional space. The quaternion is two orthogonal complexions. But there is a symmetry breaking that produces the quaternion out of a pair of conjuncted complexions. This symmetry breaking is like the difference between the two possible Kleinian bottle representations. One is symmetrical the other is asymmetrical. Quaternions allow robot arm movements to be calculated without singularities that cause stopping of the arm rotations in three dimensional space. This is the main use of Quaternions in physics. So there is an effective aspect of Quaternions which is equal to the undoing of all knots in four dimensional space. In Quaternion algebra the loss of the commutative property causes actions to matter because we cannot reverse them without additional effort. In autopoietic systems the focus is on behavior. But the knots which are tied by three dimensional behavior actually fall apart in four dimensional space. These knots do not hold except in the local three dimensional realm - they fall apart in the global four dimensional space. We watch the closed autopoietic system and we notice that responses do not follow from stimuli, this is because it is acting out series of inner states that cannot be willy-nilly retraced at will. Rather an action that leads to a state may take many other actions to reverse than the action that caused it in the first place. Yet, four dimensional space has an ultra-efficacy (ultra-efficiency plus ultra-effectiveness) which we see in the autopoietic special system. This ultra-efficacy is the dual of the differing and deferring of Difference talked about by Derrida. In organisms we call it life. Bergson called it *elan vital*. This ambiguous topology that we identify with

the Kleinian bottle dips into the ultra-efficacy of the fourth dimension. This is the key to the production of perfect balance between lack and surplus which makes the autopoietic system special. It can self produce because it has tapped into this ultra-efficacy which allows it to have no distance between original and copy. Perfect self and other recognition is possible at this unique point that allows us to push off the drift away from ourselves toward the other or the other towards ourselves. The true Self and Other-within-the self can be non-nihilistically recognized within the autopoietic system because of this possibility of bringing the ordering of the fourth dimension into embodiment within the limited spacetime of self-production.

Similarly when we move to the Hyper-Kleinian level we begin to see this in the real relations between self and other, rather than merely the internalization of that distinction. It is the shadows of the fourth dimensional objects moving that we intuit their structure. This is the level of the Octonion algebra with its metric geometry. Here social relations matter because of the loss of the associative property. It matters who sits next to whom at the dinner table. The Octonion algebra defines the metric field space within which the hyper-Kleinian bottle exists. The hyper-Kleinian bottles are autopoietic systems images. They move about and relate to one another, sometimes sharing the same circles of ambiguity, i.e. married but other times not. They are exchanging infoenergy, i.e. chi or shakti, via super-breather instantatons with other organisms in a realm where association is everything. In this social field there are attempts to bring to bare the ultra-efficacy of the fourth dimension in these social

relations as with mentalization cutting though the he said, she said images that infest the reflexive space. Mentalization is the ultra-efficacy of the reflexive social realm, as organic unity is the ultra-efficacy of the autopoietic symbiotic realm, and negentropy is the ultra-efficacy of the dissipative ordering realm. The touchstone of mentalization is the actual fusion in the marriage where hyper-Kleinian Self intersections overlap. Each sort of special system has its own form of ultra-efficacy that inhere in wholes that are exactly equal to the sum of their parts, either immediately like the Autopoietic System, or though another as it is with the Dissipative Special System, or though a series of others like it is with the Reflexive Autopoietic Special System. We say the amicable numbers are associated with the dissipative because they are out of balance by themselves. As in the myth of the Symposium of Plato given by Aristophanes each is searching for its other half. Whereas when those other halves are found then there is a wholeness and balance that does not occur otherwise.

Implications

What we see here is a use of mathematics as an analogy for a certain type of anomalous system which then we relate to negentropic systems that exhibit order from nowhere, living systems, and social systems. The mathematical models give us different views of the different emergent levels. But all of these levels occur though conjunction of lower levels into higher levels via a composition among equals, not among unequal parts. The mathematics points us to the very special nature of these special systems which we can use as a basis for

exploring the anomalous phenomena. In these phenomena the law of entropy is escaped slightly which gives these systems a tremendous advantage over everything else. This is what makes negentropic phenomena so unique, and what gives the unique qualities to life and social relations. But the key is that the mathematical models allows us to define the emergent jumps between these different kinds of wholes. Systems and Meta-systems fall completely under the domination of entropy. It is only the special systems that escape in varying degrees and probabilistically from entropy at local and encapsulated arenas. We see living and social creatures all around us because they have such an advantage once this emergent level has been reached. However, they are rare in the universe as a whole, if only because there is so much more empty space than anything else. There may be Reflexive Autopoietic Dissipative Negentropic social organisms on other worlds as well. But what is interesting is that we live in a place where they are the norm. Earth is infested with them, unlike other places in our solar system. And because we are them we have a special interest in that type of special system. But up until now we have not seen how mathematics might allow us to construct social theories about these creatures such as ourselves. Now it is clear that the way to do that is to search within mathematics for anomalies such as those we have been discussing. They are sprinkled throughout the mathematical categories, these three or five fold anomalies that specify emergent jumps between anomalous mathematical or physical objects. We need to look at these anomalous mathematical objects and attempt to see how they are related to each other. Then we need to follow out the implications of their structure

for our understanding of special systems and then these special systems can be applied to emergent phenomena like organs, organisms, and social groups of organisms. They specify the emergent leaps between the levels of organization. It is these leaps or voids between the levels of emergence of the negentropic phenomena, the living and the social that we have the most difficulty understanding. The mathematical models allow us to define the levels of organization themselves clearly and then the different mathematical analogies allow us to get different views of the nature of these levels of organization. What is astounding is that the different analogies fit together and give us a basis for mutual interpretation between them. Thus the mathematics allows us to structure our theories in non-intuitive ways that then can be compared to the phenomena themselves sometimes elucidating it in unexpected ways. This is what mathematically based theories are suppose to do. Because they are structured based on mathematics they have well defined structures. These theories can be more easily understood and also more easily tested and refuted. This is the beginning of a mathematical sociology which is also a psychology and a biology all wrapped together. It is inherently interdisciplinary because the emergent jumps take us from one discipline to another. It is the emergent jumps that are used to define the boundaries of the disciplines. This way of modeling uses mathematics as the glue that connects the disciplines. It also orders our expectations as to the organization of the various emergent levels. There are probably many more anomalous mathematical relations that can be brought to bear to explain Reflexive Autopoietic Dissipative Special Systems

Theory. I have only tried to deal with a few that might allow others to see the reasoning behind this approach. I think it is the first such sociological theory where the mathematics drives the structure of the theory. Anomalous mathematical objects are used to describe the emergent relations between levels of anomalous phenomena. It is an attempt to make Sociology, Psychology, Biology like mathematical physics in as much as the theory is structured by the mathematics and then is tested against the phenomena. The mathematics makes the theory have a certain shape that is perhaps counter intuitive so we learn from the math and then we learn from nature as we see how it fits that same mold or not as the case may be. It allows us to describe very precisely the emergent jumps between levels, how the complexity of higher levels is achieved, how elements are conjuncted rather than connected in other ways. How the ultra-eficaciousness of the various special systems is achieved. How other phenomena with similar ultra-eficacious characteristics may be understood under the rubric of the same theory. In other words it is a general theory of special systems that is made more concrete when applied to biological structures, individual organisms, and social fabrics or fields. It could be used to understand living things from another planet which had a completely different biological basis, or morphology, or social structure. But it gives us clues as to what to look for in those alien creatures, their biological infrastructure and their social superstructures. This xeno-bio-psycho-sociology is possible because the mathematical, physical, logical and perhaps schematic constraints would be the same throughout the universe.

Reflexive Sociology can only really be understood on the basis of an Autopoietic Symbiotic view of the organism, and upon a Dissipative Ordering view of the organs and the rest of the biological infrastructure. Reflexive Psychology and its Jungian or Archetypal shadow is likewise based on this same insight into Special Systems Theory. Reflexive Psychology, as imaginal or archetypal is about the meta-system within the closed autopoietic system while Reflexive Sociology is about the field that mirrors it on the outside of the autopoietic system. Reflexive Sociology and Reflexive Psychology, called Archetypal Psychology or Imaginal Psychology in other forums, are mirrors of each other that both explore the reflexive field from different perspectives, i.e. inward or outward perspectives. But we know from the Kleinian Bottle example that these are ambiguous with respect to each other. We call the hyper-complex numbers imaginary for good reason. We call the levels of organization inwardly that mirror the special systems archetypal. In other words, special systems theory gives us a mathematical basis for understanding the structuring of the archetypes that Jung identified and that Hillman has explored more recently. Jung had a profound insight when he used Alchemy as the basis of his psychology. Alchemy of Bolos of Mende was a early version of Special Systems Theory which traces it's roots back to the works of Plato who was keenly aware of the special systems and their organization. The first sociology was a sociology of special system and it appeared in the Laws and the Republic of Plato as well as the Timaeus. Plato described the different kinds of cities. The Republic and Ancient Athens describes a Dissipative Special System. The Laws describes an Autopoietic Special

System. Atlantis describes a Reflexive Special System. The city of the Laws is furthest from the influence of the sea. The city of the Republic which represents a form of Hell on Earth, because it is a city for the Gods, is close to the Sea. And the ancient enemy of Athens, i.e. Atlantis, is within the Sea and engulfed by it. Plato's goal was to produce a city that lived long like those of the Egyptians. It is therefore no accident that the Gods (Ntr) of the Egyptians has the structure of the Special Systems. The Primal Gods called the Ogdad is an image of the Reflexive Octonion. The intermediary gods of nature are an image of the Dissipative Complexions. The final gods of the last generation including Osiris and Isis are images of the Autopoietic Quaternions. Notice the series Reflexive, Dissipative, Autopoietic. This is the same series that Plato uses in relation to the sea. In other words this is the order of remove from the sea of flux under the spell of entropy. The reflexive is most prone to disperse into entropy, i.e. lose its ultra-efficacy, the dissipative is next most likely, and the autopoietic is least likely.

The only thing left to mention is that there is a combination of these various special systems and the normal system together to form what is called an Emergent Meta-system which is an image of the dynamic implicit within the meta-system. All four system views conjunct to produce a cyclical dynamic whereby order arises spontaneously out of the meta-system. This order gives us some insight into the nature of Gaia. In other words all ecologies are meta-systems and they differentiate spontaneously into ultra-efficacious special systems and normal systems under entropy. In effect this says that Gaia does have an

inherent structure but because the non-division algebras dominate the meta-system, like the sedenion and beyond, we have difficulty recognizing these subtle field effects. However, a proper reflexive sociology would be acutely aware of the nature of the meta-system as explained by Arkady Plotnitsky in Complmentarities. Bataille calls the Meta-system a 'general economy' and the system a 'restricted economy.' Between the restricted and general economy what he did not notice is that there are partially specified economies that are not fully restricted. These are special economies that are ultra-efficacious. An example of this is the relation between the Metaxalogical and the Dialectical in the philosophy of William Desmond in Being and the Between. The dialectic is a "system" as Arkady Plotnitsky shows in In The Shadow of Hegel. Both Plotnitsky and Desmond wish to go beyond this system of the spirit moving through history by showing the nature of the meta-system which is like the General Economy of Bataille. But what gets lost in this macro distinction is the fine detail of the partial systems and partial meta-systems, i.e. special systems, that are organized in the interstices between the system and the meta-system. Reflexive Sociology and Reflexive Psychology would recognize at least one of these levels, i.e. the reflexive social, perhaps the most subtle that is based on the appearance of the ultra-efficacy of the autopoietic symbiotic special system and the dissipative ordering special system. But that recognition of the Reflexive Social Special System must take place in the context of the other special systems and ultimately in the context of the recognition of the distinction between System (gestalt) and meta-system (proto-gestalt).

A Possible Ontological Basis For Reflexive Sociology

In this second part of the essay on the grounds of Reflexive Sociology we will treat the possibility of an ontological ground. The first part of the essay suggested a mathematical basis for Reflexive Sociology. This part of the essay will attempt to answer to the question why reflexive sociology is important and why a mathematical basis is necessary by coming at the problem from a completely different direction, i.e. an ontological direction. This essay answers the criticism of the earlier part of the essay which sees it as being beyond the discipline of sociology due to its introduction of mathematical analogies as a means of distinguishing system from meta-system and further in order to distinguish the thresholds of organization of special systems. The claim of the earlier part of the essay was that Sociology might become a more scientific discipline, something it has always dreamed of, by using features of modern mathematics as a basis for structuring certain aspects of sociological theory. It is claimed that a theory that is mathematically based which then is used as a guide for experimentation is more scientific than current sociological theories because it follows the paradigm of physics more closely. The idea of a mathematical and thus more scientific sociology has been part of the folklore of the discipline since its inception. But whether this is a good idea has rarely been challenged. In this ontological section we challenge the traditional idea by showing that treating sociological theory mathematically and scientifically in fact transforms our idea of science. There are some important differences between the suggested relation

between math and theory in the proposed theory than in a physical theory. In effect the whole paradigm of scientific theorizing is challenged by this strange theory of Reflexive Social systems. It is not a theory that just seeks to mimic physical science theorizing and experimentation. Instead it is a new approach to theorizing in general which proposes a different approach to physical as well as social theorizing. In other words this paradigm shift in the way we do theorizing challenges the whole Western Scientific tradition in a certain way. It challenges the duality between Sciences and Humanities that has developed as a way of framing the duality between *Physis* and *Logos* within our Metaphysical era. It sees an alternative to both the humanities and the sciences, and beyond that between academia and industry, or science in a broad sense and technology.

This approach to sociology of science and technology, as well as the sociology of the humanities including social science and sociology itself does not merely critique science, as social constructionism normally does. Rather it seeks to supercede science as we know it by introducing a fundamentally new approach which is in fact anchored in ancient approaches to nature and culture. It starts from the oldest book on Systems Theory which is at the same time the oldest sociology book, which is the *Laws of Plato*, which along with the *Republic* and other works by Plato lay out what shall be known as the Special Systems Theory. It is special systems theory that will transform our way of looking at sociology, as well as other disciplines. In the first part of this essay some attempt was made to differentiate the special systems and say why they were important to frame our quest

for a reflexive social theory. The first part of the essay might be met with some skepticism by someone within sociology who has never seen mathematics used that way before, in fact physicists too would be surprised by the way that mathematics is used in the first part of this essay. Mathematics is used in a completely new way to differentiate something that Plato already pointed out in his works, that there are different kinds of cities. He goes to great pains to differentiate various kinds of cities in his works. But the two main kinds of city that he differentiates is that in the Republic and that in the Laws. But in other places he differentiates the city of Ancient Athens and the city of Atlantis. Atlantis is much like the city of Schira described in the Odyssey. It is no accident that the city in the Republic and the city of Ancient Athens is very similar in his description. This is because he has drawn analogies between three types of cities: Atlantis, Republic/Ancient Athens, and Magnesia, the city of the Laws. Note that these cities are mentioned here in the order of their isolation from the Sea. Atlantis is founded in the sea. The city of the Republic or Ancient Athens is on the coast of the sea. And finally the city of the Laws is inland away from the sea. The sea stands for Heraclitian Flux of existence. Plato is giving us in his detailed description of the city of the Laws a view of a city raised above change on the model of Egyptian Society which he knew lasted thousands of years. Plato's work on the Laws is at once a Sociology book and a Systems Theory book. It is sociology in as much as it describes the organization of a city, with many strange features that are hard to explain. It is a Systems Theory book to the extent that it describes the system of the city in a very systematic way.

So this should give us latter followers of the founder of our discipline, i.e. Plato, that we should seek answers to sociological problems in systems theory. In fact, Plato says this in the Republic where he says that we should not search into the soul of man but rather look at cities to understand the soul of man. In other words, imponderables are made visible in the organization of society. This is a lesson we have not learned very well as yet. Psychology flourishes and Sociology seems to stagnate because we still seek to know the interior of man without reference to the social relations of men. When Plato describes three types of city he is saying that there are three kinds of soul, three kinds of elemental systems that are very special. We need to inquire into the special nature of these three kinds of system.

But we have a problem in our tradition called dualism. This is established by Aristotle with his postulation of the principle of Excluded Middle, or Non-contradiction, which he claims is the highest metaphysical principle. We cannot see the special systems because we can only really see dualisms, such as those of Descartes like the dichotomies between mind and body, individual and society, structure and function, etc. But not only does dualism blind us from seeing the special systems, it also blinds us from seeing what I call the *meta-system*, i.e. the inverse opposite of the system, that is what is beyond the system. 'Meta' here is meant in the sense of *Beyond*, i.e. what is beyond the system. In order to see the special systems we first need to see the meta-system as its inverse opposite. Let us think of a meta-system as the environment, ecosystem, situation, milieu, context of the system and the anti-

system. A meta-system is the inverse opposite of the system and gestalt because instead of being a whole that is greater than the sum of its parts it is instead a whole that is less than a sum of its parts, i.e. a whole full of holes. Meta-systems are full of niches into which systems fit. They are perfectly suited to each other in as much as one fits into the other like a hand fitting into a glove. We tend to only think of the systems we build, i.e. the positive social gestalts we see in the environment. But what we miss are the places that make room for those positive gestalts which we might say are organized differently than a system. In perceptual terms we might call them proto-gestalts, because they organize the order of our glance from gestalt to gestalt. They have an implicate rather than an explicate order in the sense that David Bohm¹⁴ meant. Until our attention is drawn to it, as say the Tao Te Ching does when it talks about useful voids, we tend not to see the wholes less than the sum of their parts which are de-emergent and we see only the wholes that are greater than the sum of their parts which are emergent, i.e. have properties that cannot be achieved by their disjointed parts. But even though we have a hard time understanding supervenience, i.e. the way that higher level properties map down to their substrates which sometimes produce emergent global effects not seen locally in systems, it is still easier to think about how parts can add up to more than the sum of their parts than it is to think about how parts can add up to less than the sum of their parts. But some examples should help. A good example of a meta-system is an operating system in a computer. What does it do? It is hard to say because it merely

helps applications work together. If it had no applications installed into it then the operating system would seem to do nothing, in fact less than nothing because it might seem as an impediment to doing anything, especially if you tried to install programs that were written for a different operating system into another brand of operating system, for instance MAC applications into a Windows Operating System. The operating system would stop you from even reading the disks and would fail. Meta-systems act as filters excluding things that do not belong in the environment they control. Systems to operate in a meta-system must be tailor made to do so. The more rigorous analogy is between the Turing Machine and the Universal Turing Machine. A Universal Turing Machine is an operating system that runs Turing Machines. The difference between a Meta-system and a system can be seen as an analogy between these two types of Turing machines. The universal Turing Machine goes beyond the Turing Machine proper to read from tape and execute multiple Turing Machines. Notice how the difference between these two formal representations is very subtle. That is why we confuse systems and meta-systems, sometimes speaking of *systems of systems* rather than meta-systems. But systems of systems are merely systems again at a higher level of abstraction, while a meta-system is what allows a system to be embedded in another system. Systems have boundaries and both within them and outside of them are meta-systems that buffer the system level in question from its subsystem and its supersystem. Meta-systems are the field that is necessary for something to contain a version of itself or to be contained by a version of itself at a different level of

¹⁴ Wholeness and the Implicate Order.

abstraction. And so this is why meta-systems lead us to consider reflexivity. Reflexivity occurs when something references itself. When this is done in a contemplative or perceptual way we call it "reflection" which we associate with mirrors, and cognition. When it is done in a behavioral way then we talk about reflexion, which is related to the word reflex which occurs when a muscle is stimulated. The English Sociologists coined this term "reflexion" to mean self-referring phenomena like recursion. There is a school of reflexive sociology that considers society as essentially a matrix of self-referring individuals. Barry Sandywell's Logology is a good example. In this school both reflection and reflexion are conflated so that self reference is seen as occurring both on the cognitive and behavioral levels in a creative interplay of social invention and construction. This school is interested in Sociology itself as a discipline which is reflexive and wishes to understand the social philosophical foundations of social theorizing. We can consider the social as the meta-system for the individuals which might be considered to be systems within the context of the social field. But in a way the social is shot through the individual organism, as it is a society of cells, which groups into a society of similar cells we call organs, which work together to make up an individual organism, which works together with other sexually differentiated organisms to reproduce the species, and ultimately to produce a society of individuals. In other words abstractly the social field permeates all aspects of the living beings we know such as our selves. Since we are interested in living beings, such as ourselves, we contemplate them and interact with them behaviorally, then we have a reflexive

relation to ourselves, which sociology as a discipline expresses in our culture. So reflexivity is seen as embedded into not just our species but all species and to operate even in the interspecies environment being a fundamental characteristic of life itself. From the point of view of natural philosophy this is a phenomenon of interest and leads the sociologist into deeper and deeper philosophical questions as to the grounding of their discipline. In a way we discover that every living being is social, and even the interspecies environment is social, especially if we think back to a time when there were other species of sapians. And this permeation of life by reflexivity is something we are driven as sociologists to understand because it is the ultimate ground of our discipline. And what is interesting is that the reflexivity hinges on our being able to perceive and react behaviorally to other creatures, especially other sapian species, especially our own species, and thereby referring not just to ourselves with respect to others but referring to others with respect to ourselves by language, and gesture, and cultural productions etc. When you start looking at sociology in this way, through the magic mirror of reflexivity one begins to see everything, even the physical world, that appears to us only phenomenologically, as an aspect of our reflexivity. And that reflexive self referencing in the context of the other is only possible because there are differences between systems and meta-systems. Systems and Meta-systems are schemas that are the conceptual equivalent of the Gestalt and the Proto-gestalt. We have to make up these terms "meta-system" and "proto-gestalt" because our language does not have good terms for them. Not even our technical vocabulary has developed good terms of reference for

these inversions of the system, because we have a blind spot in our dualistic culture for what lies between and before the dualities. The meta-system lies before and between the dualities. It is what is excluded by excluded middle. It is the field between the system and the anti-system which has been systematically excluded by Aristotle's principle of non-contradiction. Conceptually we are blind to it. Perceptually we ignore it. But it is the field through which reflection and reflexion occur. Without this field there could be no conceptual reflection nor behavioral reflexion. It is why the social as a concept is so difficult to pin down, because the social itself is one of the myriad fragmented images of the meta-system. We have good terms for all the other schemas discovered by General Schemas theory such as the Pluriverse, Kosmos, World, Domain, {Meta-system,} System, Form, Pattern, Monad and Facet. But there is no good term for Meta-system. Instead there are myriad domain specific terms such as milieu, context, situation, environment, ecosystem, field, media, etc. But once you grasp the schema of the meta-system then you will find it everywhere, and see that academics have struggled to express it in myriad ways. Understanding that society is a characteristic example of a meta-systemic phenomenon at a particular level of ontic emergence is easy. What is not so easy is to see that from a formal point of view the meta-system is a whole less than the sum of its parts. How is society a whole less than the sum of its parts. Society is what is left when you take away all the individuals that form the society? What does that mean? It means that if we consider individualism an illusion, and notice that social relations come first before individuals, then society is that always already there milieu that

individuals discover themselves within and develop their individuality in relation to. In other words as Durkheim and other sociologists have pointed out society comes first ontologically before individuals. Individualistic society comes second after a pre-individualistic society which is our primal social ground. That primal social ground is a meta-system within which the systems of social individuals appear, interact and disappear. The reason that Sociology as a science has had such a hard time establishing itself, is that once dualistic and individualistic society corrupts and displaces the primal social ground then it is hard to see the field effects prior to the arising of individuals from which social individuals are forged. Sociology like Ecology is an intrinsic meta-systemic discipline. That is why they can so easily meld into a sub-discipline like social ecology. But that is also why sociology and ecology have such a hard time establishing their scientific credentials. Disciplines that study systems are not in the blind spot of our culture that obscures meta-systems. That is why sociology is a very important discipline. Its theory has to come to terms with the meta-system in some way and confront the a major blindspot of our dualistic culture and tradition. Ecology addresses the side effects of systems within the environment. Sociology addresses the side effects of individualism in our culture. On a small fragile planet in the vast wastes of space we must stop destroying non-renewable resources and other creatures and we must learn to get along with each other. It is no accident that both ecology and sociology appear together in this summary of the most important task of humanity in the age of globalization. Recognizing the worldwide meta-system

and how the various systems fit into that meta-system is the task of a future discipline of Meta-systems Theory and Practice of which sociology and ecology are the first embodying disciplines. Whether we are able to rise to this challenge is something yet to be seen. But slowly both Sociology and Ecology are shedding the scales from their eyes and seeing beyond systems into the meta-systemic fields that must be explored if we are to realize the full potentials of these new and essentially different meta-systemic disciplines.

So let us begin by recognizing the importance of developing meta-systems theory and practice as the inverse dual of systems theory and practice. But let us not stop there because, the sort of reflexivity that the environment allows us to establish is really just the beginning of a series of levels of the unfolding of reflexive reference within society. By looking at these levels we are exploring the inner nature of all reflexive fields. The reflexive fields are not monolithic, but are instead segmented in emergent ways, in one direction, de-emergent ways in the other direction. If you are traveling from the meta-system to the system then there are particular stages of emergence, where there is a quantum leap in organizational capacity. On the other hand if you are going from system to meta-system there are also thresholds in which organizational capacity is lost. These are very specific thresholds called the special systems. They correspond to organ, organism, and reproductive binary organization of two organisms. They stand between the extremes of the society of cells of all kinds in the body as a whole, and the social field itself between individuals of our species and all species on the other hand.

Here of course we want some term to distinguish the social field prior to the arising of the individual human and we will use the term from Deleuze and Guattari called 'socius' for that primal social field. We will use the term 'gaia' for the field prior to the arising of the difference between all the organisms of different kinds on the planet. In other words socius and gaia are proto-gestalts, something coming before the gestalt is recognized, like the movement of the eyes from gestalt to gestalt prior to the recognition of any particular gestalt. Thus there is a socius that is the social field prior to any individuals being differentiated, and the gaian field which extends that to all animals other than just human beings. In the Gaian field sociology and ecology as separate disciplines merge into *social ecology*. Now it is clear that all these levels are social in some sense and we call that general sense of sociality "reflexivity" because it is not just conceptual but behavioral because we are embodied in the physus of our bodies. There is a logophysical and a physiological chiasm in which reflexivity and reflectivity merge into a single double sided, or holonic state of affairs. Arthur Koestler inaugurated the discipline of holonomics by the identification of the holon which is both part and whole at the same time. Special Systems, these intermediates between the cells and the individuals of the planetary man or the planetary creatures are holonomic. In other words they have a special ordering which is holonic. Holonic ordering balances the nature of the part and the whole in the same thing. We can call advanced sociology and advanced ecology holonomic disciplines. Each of them would look beyond the individual creatures or individual humans to see the part/wholes of which these

individuals are composed as they express the socius and the gaian field. Holonomic systems are partial systems and partial meta-systems. They are something else than either the system or the meta-system. They have special properties that neither the system nor the meta-system have because these are both trapped in entropy. Whereas special systems are neg-entropic in the sense that this term is used by Prigogine. These special systems occur in far from equilibrium environments where local lapses in the second law of thermodynamics are achieved briefly. Thus we will call these systems that are negatively entropic ultra-eficacious which is a combination of ultra-efficient and ultra-effective. By probabilistically escaping ever so slightly and for ever so short a period entropy these systems have conferred on them a tremendous advantage over everything else in the universe. This explains why our planet are covered with living creatures. Once this advance into the realms of negentropic systems occurs then it spreads like wild fire to every niche in the meta-system of the planet. Life is everywhere on our planet, but we do not see it anywhere else in the solar system yet. We find ourselves to be unique in this corner of the universe. Our uniqueness comes from the neg-entropy that all living things share. It confers on us the unique ultra-eficacy that we recognize in life. But that ultra-eficacy does not just stay with one celled organisms, but these organisms combine in various ways to form multi-celled and more complex organs and organisms. Thus we get a form of combination which is unique to the special systems as well which is conjunction. Cells form symbiotic unions, like the mitochondria that appear outside the nucleus in every cell. This symbiotic combination of cells is

another threshold of organization different from the cell itself, it leads to organisms that are made up of organs. Organs are the best example of holons. They are at once wholes and parts without their wholeness nor their *partness* conflicting. Finally higher organisms need each other for reproduction, and this ultimately leads to social relations between organisms, not just of humans but of almost all creatures. So there are three levels of organization between systems and meta-systems that are immersed in entropy. These are the dissipative ordering special system, the autopoietic symbiotic special system, and the reflexive social special system. Each of these special systems represents systems that are exactly equal to the sum of their parts formed by conjunction and expressing ultra-eficacy. An example of this sort of ultra-eficacy is consciousness. These special systems are specific levels of organization below the gaian field or the socius field considered in their planetary scope. We can see them as related to the organ, organism, and the reproductive binary couple. They are the levels of organization achieved after the most primitive cells begin to co-evolve. The primitive proto-cell is the prototype for the more developed cells we see around us today that are fully co-evolved. But what Special Systems Theory tells us is that this is not something specific to evolution of life. But that this is a formally differentiated set of possible schemas that exist between the system and the meta-system. In other words we need to generalize from life, consciousness, and the social as ultra-eficacious phenomena that are based on possibilities grounded by the special systems to the formal grounds themselves in schemas, i.e. templates of understanding

and organization that are ultra-efficacious and produced uniquely by conjunction where the wholes are exactly equal to the sum of their parts. Special Systems theory is general like systems theory or ecological meta-systems theory and this generality allows us to look for other phenomena organized by this same schema that is not living, conscious or social. And it is through the generality that we can approach the mathematical analogies that supports our intuition that there must be different levels of organization at work here with specific emergent properties appearing at each level of organization that appears between system and meta-system. In the first section of this paper I have suggested some of these mathematical analogies. In my paper Reflexive Autopoietic Dissipative Special Systems Theory I go further suggesting other analogies. There is a whole series of studies called Reflexive Autopoietic Systems Theory that attempt to explore the implications of this theory. And then there are papers written for ISSS and INCOSE conferences that attempt to present them to specific audiences. Here we will not repeat that material. Rather our focus is on why it is important to attempt to distinguish these emergent levels of ordering mathematically.

Mathematics is used in Physics to build theories that are structured on the basis of various mathematical categories. But Sociology and other social science disciplines find it harder to apply mathematics to their theory building enterprises. But here I want to suggest that this is not because mathematics does not lend itself to this purpose, but because social scientists have not approached mathematics in the right way. A lot of new math has appeared over the last century.

Sociologists tend to learn only rudimentary math perhaps up to Calculus but emphasizing Statistics. Higher mathematics is not studied for the most part, because it is assumed that it will not help in any significant way the theoretical sociologist. But allow me to question that assumption. Sociologists should study all social phenomena, we have sociology of science, sociology of technology, and we turn around and use science and technology in our lives as well. So why not sociology of math in which we turn around and use the math in our theorizing. In other words there is no intrinsic barrier to studying the social invention and construction of mathematical categories, and there is no reason not to turn around and use the mathematics in our own theory building endeavors. Thus I hope in the future that graduate students in sociology will take it upon themselves to search the vast imaginary space produced by mathematicians in the last century for analogies and useful structures for constructing theories in the future, just as physicists do today. I have done that and have found that by looking at the mathematical categories in a different way than normally done, it is possible to see how some of these mathematical structures can be used to help produce theories useful in sociology and other disciplines. Instead of using the categories themselves as is normally done, I have focused on the differences between categories and found in those differences a useful analogy for the jumps from one organizational level to another, such as those we have been talking about. In other words, the jump from system to meta-system, and within that jump the sub-jumps between dissipative, autopoietic and reflexive special systems can be modeled with various mathematical

structures from extremely simple to the very complex. In our discipline it is the emergent jumps between levels of organization that is so troublesome to explain. Why not use the differences between mathematical categories as analogies to explain them? It is a different approach than physicists use in their appropriation of mathematical categories. They usually use a whole category to represent the ordering of some phenomena, like a group. What they do less, but still do sometimes is use a series of groups to explain the jumps in organization between different physical phenomena. But this rarely used way of approaching the segmentation of phenomena based on the segmentation of mathematical categories can be appropriated by us as sociologists as a way to frame our theories of emergent phenomena. If we do that we move from the philosophy of science of Aristotle to that of Plato. Aristotle's philosophy of science is about the common view of things. Plato stresses the anomalies and exceptions as exemplars. So why not search mathematics for anomalies in the segmentation of categories and use those anomalies to explain anomalous sorts of systems, such as living systems, conscious systems, and social systems. As we do so we realize that living things are themselves meta-systems for each other though predator prey relations. Consciousness is a meta-system as is the social. They are fields that contain other phenomena. The dictum is that anomalies of difference between mathematical categories elucidate the differences between anomalous phenomena. That is what makes these sorts of systems special. They are anomalous in their characteristics. Those anomalous characteristics are analogous to the anomalous mathematical characteristics of

various categories relations to each other found throughout the mathematical realm. It is a simple idea that anomalous differences between categories in math elucidate the anomalous differences between phenomena. Whereas in physics the tendency is to use categories to explain sameness and continuity by using whole categories to isomorphically encapsulate the ordering of a phenomenon. The novel use proposed here the social sciences is radically different. We use the differences between categories that are anomalous to explain differences between anomalous phenomena. We are attempting to focus in on the edges of discontinuity between emergent levels rather than bounding a whole phenomenon and showing its internal ordering.

This approach that we associate with Plato who shows us anomalous exemplars rather than appealing to the common as Aristotle does is bolstered when we realize that Plato himself was trying to differentiate the various kinds of special systems in his works though his differentiation of the descriptions of cities. We are sociologists so we should be interested in cities as social constructs. But we have given over Plato's Laws and his Republic to Political Science which ignores it. Philosophers also ignore the Laws because it is not as mystical and exciting as the Republic. But few people ask why Plato would write a long boring book like the Laws. It must have been because there was something in it he wanted to explain to us in detail and very thoroughly. But we cannot see what is in it until we look at the differences between cities he describes. And his cities are anomalous. They all have odd features that no real city has. This oddness of Plato's

cities is the key to understanding his message, which is that there is a difference between the special systems embodied in his cities. And if that difference is not clear enough he also writes the Symposium where that difference is represented yet again as the difference between the various speeches at the party on love. Plato's work is literally full of references to special systems. In fact, if you find something odd in Plato, and his work is full of oddities, it is probably some oblique reference to special systems. He must think these kinds of systems are very important to embed them as a subtext throughout his work. The funny thing is the secret to unlocking this subtext is merely to take seriously the organization of the various cities he describes. In other words if we have an interest as sociologists in cities and we treat the descriptions of these cities systematically and look carefully at their differences then we quickly arrive at a concept of the differences between the various kinds of special systems. But the leap is to then apply Plato's own method to mathematics rather than Aristotle's. If we look into the differences between mathematical categories rather than considering only what binds them together, then we see that they describe emergent levels of organization. If we search for anomalies in these crisp definitions of differences we find that they all are very similar to the differences that Plato is defining between his cities. So Plato is trying to show us something that is not just an odd empirical phenomena but is in the substructure of all phenomena being part of the nomos that is non-dual between physis and logos. Suddenly we have a Platonic Social Theory which is at the same time a systems theory or meta-systems theory that is mathematically grounded. To make this

fully scientific in the sense that physics sees itself as fully scientific it is only necessary to find some physical phenomena with this same structure, and lo and behold they exist¹⁵. So these mathematical structures actually are embodied in *anomalous* physical phenomena. With that the entire explanatory regime is complete. A social theory of the different kinds of cities that we treat systematically comparing them in Plato's works, which we find mirrored in the differences between mathematical categories and which we find in analogous physical phenomena. Suddenly sociology as a discipline leaps to the head of the class of scientific disciplines. Sociology is suddenly the first discipline to study special systems as it is embodied in Plato's works. Plato was systematic about how he presented special systems theory in the differences between his cities in his works. He used cities because he said souls were too difficult to see into, so the differences between his cities were in his opinion differences between souls. Souls are special kinds of entities that are ultra-efficacious because they are incorruptible, whereas the body is corruptible, i.e. gets overcome with entropy. We cannot see into the soul but we can see it exemplified externally by social structures called cities. But this indicates that Plato's sociology is at the same time a psychology. Reflexive sociology has a twin in Reflexive Psychology which is archetypal. This is why we see these same structures appearing in the works of Jung who found them in various strange cultural contexts such as Alchemical texts. When we bring back the

¹⁵ These are solitons at the dissipative level, superconductivity at the autopoietic level and Bose-Einstein condensates at the reflexive level.

special systems theory to the reading of Plato's works many of his difficult to understand analogies become much clearer. Plato's references are oblique and odd because special systems are odd. He was describing something odd and thus his descriptions fit with what he was describing. All this was lost on Aristotle and because Aristotle's philosophy became the gold standard due to its appeal to the common sense, we lost track of another hidden tradition within our own tradition which was similar to many eastern philosophical traditions which discovered the special systems themselves and described it in different ways like Buddhism and Taoism. These other traditions spawned sciences based on special systems related effects like Acupuncture and Homeopathy. So special systems theory forms a bridge between Western Science and these alternative non-dual world traditions which we find so interesting because they offer an alternative to dualistic ways of seeing things. But sociology does not have to embrace these global connections to other non-dual traditions to see the usefulness in having a way of distinguishing various layers of emergent phenomena that are very important like life, consciousness and society. We can appeal instead to the philosophy of Deleuze and Guattari for an analog. They distinguish desiring machines, the individual and the socius. For them individuals are illusions and what is real is the rhizome of desiring machines as connecting to form flows across bodies embedded in the field of the socius. This theory fits well with the distinctions made between the special systems by Plato, by Mathematics, by various anomalous physical phenomena like solitons, superconductivity, and Bose Einstein

condensates. It fits well because it is a philosophy of heterogeneous differences rather than continuities and identities. There are various theories from the postmodern tradition that can be brought in to comprehend what special systems are concerned with. For instance, Derrida talks about Differance which is made up of differing and deferring. But I claim that this is the flip side of efficiency and effectivity of effacacity that appear as ultra-efficacious in the special systems. Deleuze describes this in Difference and Repetition as the difference between differentiation and differentiation. By exploring the horizons of Being various Postmodern philosophers have approached distinctions that are similar to those seen between the special systems.

In fact, one claim I make is that Being itself is discovered in the Postmodern period as being fragmented into kinds of Being as well as aspects. The kinds of Being are meta-levels in relation to each other. There are four meta-levels which are Pure, Process, Hyper and Wild. I claim that these kinds of Being are the differences between the special systems which represent a model of Existence rather than Being. In other words if we hike up the hierarchy from system through dissipative, autopoietic and reflexive special system to the meta-system, the four differences between these types schemas are the fragments of Being, of which there are only four. There are only four because at the fifth meta-level of Being you encounter the unthinkable, which is the non-dual, i.e. poignant silence which can be interpreted as Nagarjuna does as Emptiness or as the Taoists do as the void. Postmodernism is the discovery of the various meta-levels of Being, and implicitly

this is a rediscovery of the special systems, because these emergent differences between kinds of Being, are types of nothing that are significant each in its own way. Our exploration of the realm of discontinuity opened up by Deleuze and other philosophers of difference is just beginning. But what exists in that realm is what Plato has already told us about, which is the special systems schemas which are the basis of life, consciousness, and the social. These three phenomena cannot be separated, so our non-dual holonomic sociology must at the same time be an archetypal psychology of the soul which Plato also inaugurated and which has been followed up by Jung, Hillman Giegerich and others. Archetypal Psychology must be reflexive and is a pair with the reflexive sociology of Barry Sandywell, John O'Mally, Alan Blum, Peter McHugh and others who have carried on this brand of philosophical social theory since the seventies. The non-dual reflexive eco-psychosocial and eco-sociopsychical discipline that is also logological and physophysical¹⁶ also gives us the chiasm of physiology and the logophysical field that was created by Plato. It is also a holonomic biology like that existential biology of Maturana and Varela, i.e. a biology of the individual organism rather than the species. That biology is founded on a non-dual physics that combines with thermodynamics rather than separates itself from it to explore complex systems that are far from equilibrium such as that developed by Prigogine. All these chiasms of the sort described by Merleau-Ponty are not just

¹⁶ This means the reflexivity of the physis which is the dual of the reflexivity of the logos. For instance in the phenomena of 'touch touching' discussed by Merleau-Ponty in The Visible and the Invisible.

confused fusions of ambiguities because they are rooted in anomalous mathematical models of difference that we can refer to physical anomalous models of difference. This is a new science of discontinuous emergent differences but which at the same time goes back to the roots of our tradition in Plato, and beyond that into Egypt where it can be seen in the structuring of the Egyptian Gods (Ntr). Plato tells us he gets his knowledge from Egypt and sure enough we see clear signs of it when we study the relations of the generations of the Egyptian gods to each other. This gives us good reason to suspect that Alchemy that also arose in Egypt as well as China was originally a science of Special Systems. So at the end I am suggesting that Sociologists and Psychologists return from the land of entropic explanations of systems and meta-systems to reclaim the heritage of Alchemy and concentrate on the description of holonomic special systems as transformative alchemical systems. We should as Jung suggested all become modern day alchemists. Jung said that the first psychologists were alchemists, now we can understand that perhaps the first sociologists were alchemists too as they traced their roots to Plato.

Reflexive Being and Existence

We have proposed a theory which intertwines Being and Existence as a means of comprehending the nature of Reflexive Sociality. A good model of reflexivity is that given by Damjan Bojadziev¹⁷ on his web pages¹⁸. We will use this model and extend it in order to explore the concept of the

¹⁷ <http://nl.ijs.si/~damjan/me.html>

¹⁸ <http://nl.ijs.si/~damjan/is-2001/is-2001-1.html>

reflexive social system. Bojadziev in his work has produced an analogy between Godel's incompleteness theorem and mirror reflection. He has linked that work to Lacan's work on the mirror stage in infant development. But we are concerned with something more complex which is social reflexivity. The special systems have an analogy with mirrors. A normal real (or true, or present, or identical) system is one in which there is just one mirror in which self-reflection may occur. But the first special system which is dissipative ordering has two mirrors that face each other like those seen in many barber shops. Onar Aam discovered this analogy between mirrors and the hypercomplex algebras. The complex algebra is like two mirrors facing each other. As we move up the series we discover that the autopoietic symbiotic special system is like three mirrors facing each other which is analogous to the quaternion hypercomplex algebra. Moving up again we find that the reflexive social special system is like four mirrors facing each other, forming an inwardly mirrored tetrahedron. It is related to the Octonion hypercomplex algebra. Beyond that there is no way to face regular non-distorted mirrors to face each other, so we then enter the mirror house of distorted mirrors where there are five or more mirrors facing each other there must be some distortion. This is similar to the mathematical fact that equations of degree five cannot be solved due to limitations of group operations of the group A5. There is a natural limit here that shows up mathematically in various realms of mathematics. We associate the mirror house with the Meta-system which is related to the general economy of Bataille. The Meta-system is related to the sedenion

hypercomplex algebra and other higher non-division algebras. So the question becomes how to extend the formalism of Bojadziev to cover these more complex cases of reflexivity. Here in the last section of this paper we will attempt to make this extension. What is important to recognize here is that the special systems are extensions of this model of self-reflection and self-recognition that has its roots in the work of Godel. It is in fact the model of the inwardly mirroring tetrahedron that corresponds to the reflexive level, but each level has a concatenation of mirrors of lesser complexity that must be recognized. So reflexivity is shot through and through the real as well as the special and the meta-systems. We are talking about a formal hierarchy of mirroring configurations that can occur in three dimensional space. Four dimensional space in its relation to three dimensional space can be seen as a mirroring configuration as well. That configuration is external to the three dimensional in as much as each three dimensional space is embedded as a slice through four dimensional space. The two sides of that slice can be seen as mirrors. There are four three dimensional spaces in this four dimensional space with one of these designated as real, identical, present and true. All these three dimensional spaces together have twelve virtual axes. Four dimensional space is the Quaternionic relation between these twelve virtual axes which sets up four dimensional space as a set of three mirrorings facing the real three dimensional space in relation to the other three. The four together have octonionic relations to each other creating the inwardly mirrored tetrahedron. So the three mirrors facing each other at the autopoietic level only exists if one designates one of the three

dimensional subspaces as real. The two mirrors facing each other are the two on either side of the three dimensional slice. The single mirror is the three dimensional slice itself in its relation to the other three dimensional subspaces that make up four dimensional space. This means that our concepts of four dimensional space, such as those that abound in physics as special relativity for example, are ways of seeing into this mirroring in which the three dimensional world is embedded. In fact, the recent work on doubly special relativity is very interesting because it establishes two observer independent thresholds, not just light but also the plank's constant and thus ties together quantum mechanics and relativity theory. Both of these theories use complex numbers as a way of expressing their fundamental descriptions of nature. When we combine them we come up from the pairs of complex representations in Relativity and Quantum Mechanics to the Quaternion level through a symmetry breaking in Double Special Relativity that as not been explained yet to my knowledge. Use of complex numbers suggests mirroring. So that when we are looking out at nature we are seeing mirrors at a fundamental level in the physus. This is the connection between physics and reflexivity that we need to emphasize. To the extent that physics appeals to hypercomplex algebras to describe nature it is projecting reflexive mirrors at the fundamental level of nature and seeing the universe as reflexive. This same reflexivity places limits via Godel's theorem on our ability to build self-contained descriptions of systems. Systems always spill over into meta-systems. And that spill over contains glimpses of more subtle thresholds of organization of self-reflexivity that are indicated by the theory of

the special systems.

All the special systems are models of existence as opposed to Being. We have noted the complementarity between these models and the fragmentation of Being into meta-levels. The meta-levels of being demark the discontinuities between the levels of normal, special and meta-systems. On the other hand the special systems demark the discontinuities between the kinds of Being. This mutual demarcation and complementarity of Existence and Being provides the grounding for Reflexive Sociology and Reflexive Psychology that explores the realms created by the more and more complex configurations of mirrors and the projections that produce images or representations in those mirrors. Being is about projection, and the kinds of Being are more and more subtle forms of projection. As we move up the hierarchy of mirrors different forms of projection, called transference in psychology, are needed at each stage. The kinds of Being describe these more and more subtle types of projection. Much of Continental Philosophy has been about the exploration of these different kinds of Being. Heidegger began the process by *differt/iating*¹⁹ the difference between the present-at-hand and ready-to-hand in Being and Time. I call these two different kinds of Being associated with these modalities Pure Being and Process Being. The second modality mixes Being with Time to get a type of Being like Heraclitian Flux as opposed to the Parmenidian Pure Being which is static and eternal. Heidegger himself went on to discover the next higher meta-level of Being called Hyper Being. Heidegger called it

¹⁹ See Deleuze Difference and Repetition

~~Being~~ (crossed out) and Derrida followed him and called it DifferAnce. Merleau-Ponty called it the hyper dialectic between Heidegger's Process Being and Sartre's Nothingness as Metaphysical Antinomies. Merleau-Ponty went on in The Visible and the Invisible to define what he called Wild Being which is what is left over when the metaphysical antinomies cancel. Many philosophers have tried to build philosophies at the upper reaches of the meta-levels of Being. Deleuze and Guattari are the best example of philosophers and psychoanalysts who have attempted to build a philosophy at the level of Wild Being, but we can also mention John S. Hans, Cornelius Castoriadis among others. We have tended to use the philosophy of Deleuze and Guattari as a touch stone because it fits well with the hierarchy of special systems theory. In fact we can reconstruct that hierarchy in the following way.

Meta-system	N-mirrors of Mirror House	rhizome
Wild Being	Bootstrapping projection	tattooing
Reflexive Social Special System	Four mirrors as quadra-flectivity	socius
Hyper Being	Anamorphic projection	encoding
Autopoietic Symbiotic Special System	Three mirrors as tri-flectivity	individual

Process Being	Rebounding projection	coupling
Dissipative ordering special system	Two mirrors as bi-flectivity	Desiring machine
Pure Being	One way projection	Line of flight
system	One mirror as reflectivity	Body without organs

The Social Reflexive level is singled out because it is a natural threshold or limit prior to the entry of distortion into the field of reflexivity. This is the highest level of non-distorted reflexivity and that provides the basis for our social invention and construction of the world. It appears in the fundamental social institution of marriage celebrated in the Odyssey, one of the two founding epics of the Western tradition. It is the basis of collective consciousness and collective unconsciousness. Jung speaks of the archetypes in the collective unconscious but avoids the mass behavior of the collective consciousness such as those talked about by Cennetti in Crowds and Power. Cennetti also talks about the pack as the primal social group which is called the fused group by Sartre in Critique of Dialectical Reason. It is the four facing mirrors of the reflexive social special system that allows us to form teams in which mentalizing can occur based on the kind of Trust that Jonathan Shay sees as crucial ultra-efficient grease for military organizations. Sociology has not had a

good model of collective consciousness before. However, a subset of psychology based on the work of Jung has developed a good model of the collective unconscious and its archetypes. What we need to realize is that the fused group's mentalization of each other is a form of collective consciousness which is the flipside of the collective unconsciousness that appears in dreams and myth and folktales and other phenomena studied by archetypal psychologists. Intellectuals after world war two eschewed collective or mob behavior and thus ignored it. Our individualistic society is threatened by it. But we must suppress our distaste for mob behavior and recognize that at its root there is the fused group and the hunting pack talked about by Sartre and Cannetti that should be the basis of our team social-psychology. And that social-psychology or psycho-sociology should be based on reflexive sociology which is in turn based on the special systems theory.

The projection of Being and the reflection of the mirrors of the special systems go hand in hand to create a dynamic that has various thresholds of organization that is the basis for the organization of society and its various social horizons. The hunting band of prehistoric hunter gatherer times becomes the empowered team today within our corporations. Jonathan Shay points out that we need to keep our fighting teams together. That is because it is necessary to produce social autopoietic systems, i.e. closed systems that are ultra-efficient. Part of that ultra-efficacy are things like trust that are crucial within the social world, but which gets ignored by sociologists because they have no model for ultra-efficacious social phenomena. Special Systems Theory

gives us that model for the first time. The Reflexive social special system is the foundation of that ultra-efficacy at the social level. Without that possible lack of distortion that makes possible mentalization there would be no social fabric to connect individuals within our world. Thus special systems theory and the various levels of projection forms the foundation of a new kind of sociology that is mathematically based and scientific in a new sense not achieved before within this discipline. But that new sociology also transforms our concept of science itself, because science itself operates on the basis of the undistorted reflexivity that we are describing based on formal and mathematical models.

Higher Order models of Self-Other Recognition

Based on the work of Bojadziev we can compose higher order models of Self-Other Recognition. In these higher order models we will have two, three, four mirrors. We can extend his mathematical notation. Instead of $F \rightarrow G$ and $P(d(x)) = F \rightarrow P(d(F)) = G$ we will have also $H \rightarrow I$ and $P(e(y)) = H \rightarrow P(e(H)) = I$. But notice that there is also directed gaze at the other $F \rightarrow H$ or $H \rightarrow F$ and recognition of the other $G \rightarrow I$ or $I \rightarrow G$ besides recognition of the self in the other mirror $P(e(x)) = F \rightarrow P(e(F)) = G$ and $P(d(y)) = H \rightarrow P(d(H)) = I$. This whole situation gets very complex. Here is a resume of possible scenarios.

Direct seeing of part of the self
Looking at the other directly
Looking at the self in mirror A

Looking at the other in mirror A
Looking at the other in mirror B
Looking at the self in mirror B
Self-recognition in mirror A
Other recognition in mirror B
Other recognition in mirror A
Self-recognition in mirror B
Identity between self-recognitions in two mirrors
Identity between other-recognitions in tow mirrors
Identity between other-recognitions and direct seeing
Ramified images
Met gaze between self and other through mirror
Met gaze between self and other directly

What is interesting is how the various aspects of Being fit easily into this scenario of multiple mirrors. Presences are broken up within the images in the mirrors. Truth amounts to the use of the mirrors as prosthetics as if they are actual senses which Umberto Eco advocates. Reality is the testing of images against direct seeing. Identity has to do with how the various ways of looking at things sometimes coincide so that the ramifications of images fall away. For instance when we meet the gaze of the other though the mirrors. This is equivalent to mentalization. In mentalization we know what the other knows despite all the multiple images of their possible knowledge via our theory of mind that we project onto them. Theory of mind is really based on mutual self-other recognition. When mutual self-other recognition occurs the false images that are produced fall away. But in the mirror house between the mirrors the false images proliferate and that is why we have the aspects of Being as a

means of sorting out what is true and real, identical and present. The aspects of Being are adapted to the mirror house. That is why they are those aspects and no others. They are the adaptation to the mirror house and our means of cutting though the mirror images. The mirrors stand for any coding medium, for instance it could be language. Truth is the correctness of the image in the coding medium. Reality is when we compare the images to the actual things we can look at without the coding medium. Presence is the appearance of the images as absences over against the actual presence of the thing that is generating the images. Identity is when different perspectives within the mirror house coincide. The aspects of Being actually lock together to give us a way of navigating within the mirror house. This is a major finding because it has always been a question as to why these aspects and no others. It is because of the self-reflexivity within the environment of multiple mirrorings. The aspects are needed as a guide in that environment. We often see one mirror, but only occasionally see two facing mirrors, most likely in bathrooms. But we rarely see three facing mirrors and almost never see four facing mirrors. However, almost everyone has experienced the distorted mirrors of a fun house. We can look at it as the first mirror is my private language and the second mirror is your private language. The third mirror can be seen as our public language as we are immersed in the chatter of the They. This means that the fourth mirror is the language of the Other, i.e. the chatter of Them as opposed to Us. An interesting thing is that the relations between the F->G i.e. percept to concept, self to self-recognition, in the case where there are two agents gives us a tetrahedron. In the case of

three agents gives us an Octohedron. In the case of four agents gives us a Cube. Notice that the Octohedron has the property of non-self-interfering flow. Notice that the Cube is the epitome of stability. A tetrahedron is the smallest possible 3D solid. Also notice that the octahedron forms a triple helix as it moves up the shaft between the three mirrors. This is the form of an unfolding dialectic. The tetrahedron connects the percept of the one to the concept of the other and vice versa in a stable fashion. When a third agent enters we immediately fall into a dialectic which has optimal flow in its unfolding. When the fourth agent enters we get a stable all space filling structure. This collapses when you add the fifth agent. Either you go into the mirror house if you stay in the third dimension or if you move into the fourth dimension then you get intersecting and interpenetrating mirrors. This is just like the impossibility of solving fifth degree equations due to the A5 group's interference. It is just like the breakdown of Being into Existence at the fifth meta-level. It is not so much that three is a crowd but that five is a crowd. Three is a dialectic, four is stable, and five is a mirror house or an interpenetrating higher dimensional landscape of mirrors such as you get in the pentahedron of four dimensional space which can be seen as five interpenetrated tetrahedrons. These five interpenetrated tetrahedrons can be described by two mobius strips and thus is a Kleinian Bottle.

What we see is that the Platonic forms are inscribed into the mirror space set up by the self-reflexive formations as a means of producing stability. The icosahedron-dodacahedron have a five fold symmetry that is based on the group A5 and that is

the same group as the 4D Pentahedron. So the icosahedron-dodacahedron structure relates to the level of the fifth agent and the fifth mirror if we stay within the third dimension. But exactly the same group structures appears in the four dimensional level where we have interpenetrated mirrors instead. We also know that there are Penrose five fold tilings that are aperiodic. So even though the five fold tiling is not all space filling there are aperiodic tilings that can simulate all space filling that are related to the icosahedron-dodacahedron structure. The mirror house is not without its own possible forms of dynamic order. The Sedenion has islands of divisible order within its non-division extensions. As the mirrors break up in the mirror house they still have some fragmented ordering that we can detect. But the flip side of the distortion of the broken up and warped mirrors is the interpenetration of mirrors in four dimensional space. This interpenetration of the mirrors is the underlying supra-rational basis that is opposite the paradoxicalities and absurdities of the mirror house.

Plato, the first social theorist and the first systems theorist who teaches us about the special systems placed over the academy door a saying that only those who know geometry should enter here. It is strange that after all this time we begin to understand that this applies to the sociologists as well. We tend to think that mathematics and physics should not influence our work on human things, especially social things. But eventually we see that it is precisely mathematics and physics that we need to understand in order to see analogies for the special systems in simpler forms which allows us to understand them so we can look for them at

the level of the social where they were first described. We can understand that Aristotle was indeed the true pupil of his master in as much as he created a philosophy of life where living things are the paradigm, i.e. autopoietic special systems. Aristotle created an image of the city of the Laws in the mind and its influence lasted a thousand years. It was very long lived as Plato suggested that it might be. Aristotle's philosophy is a projection of the living psyche out to cover everything and it was a very difficult spell to break. I have not found evidence of self-conscious imitation of the special systems in Aristotle yet. But I expect to discover it, because even though Aristotle disagreed with Plato on many things, what I think they did agree on is that living autopoietic symbiotic systems are the epitome of things in the world and the basic structure on which the structure of the schema of the world is based. Reflexive Autopoietic Systems are those that project final cause, because they have intention. That intention is an ordering that reorders the world as a dissipative structure through the production of artificial things as culture. If we look at Aristotle phenomenologically then we can understand his Alchemy, i.e. his belief that it is possible to inter-transform things. It is in consciousness that this inter-transformation may take place not in the physis. Inter-transformation is what occurs when the images bounce though the interpenetrated mirrors in the fourth dimension. Representations that do not escape the third dimension become distorted and thus we get the difference between the true world and the world of appearances. There is this hint that Plato and Aristotle together can be seen as giving us a phenomenological description of the mirror house within which we live with

others that we call the social. If we see Aristotle attempting to build a city like that in the Laws in the mind instead of within society then the two projects complement each other. Suddenly we see a different basis for Sociology as a reflexive autopoietic dissipative science in the works of the greatest figures of our tradition. As sociologists we need to rediscover that lost tradition and see how the alchemy of the social that they describe might work.

The Grounds General Schemas Theory

We have described how a reflexive phase space is created between four actors with four mirrors which appear as an inwardly mirrored tetrahedron. We have noted how this phase space takes on a cubic relationship between the various actors and their mutual self recognitions. This stable formation at the reflexive level of the unfolding of mirror configurations is the last in a series in the emergent development of the phase space. It went through the unfolding of one mirror, two facing mirrors, three facing mirrors and then four facing mirrors which eventually breaks down into the warpings of the mirror house in the third dimension or the interpenetrating mirrors of higher dimensional space. These configurations are created by looking at the self-reflexive configurations of Bojadziev and conjuncting them with one agent and one mirror added at each emergent level. What we saw is that at the level of the dissipative special system a tetrahedron was formed between the F and G of one actor and the H and I of another actor. The F and H is the body of the actors, while the G and I is the self-recognition of the actors within the mirror. This tetrahedron of relations

unfolds into a dialectically unfolding stack of octahedra with three mirrors and three actors. Octahedra are non-blocking with respect to the flows through the lines of the figure and thus ultra-efficient at the autopoietic special systems level. Finally these octahedral relations between actors unfolds into a cubic set of relations between four actors with four mirrors. This is at the reflexive special systems level. This is a very stable configuration of relations between percept and concept at the social level. The cubic configuration is all space filling. We hypothesize that this cubic configuration is a version of the Greimas cube. In other words, according to Greimas stories take on a form related to logical contradictories and contraries. This form distinguishes anti-A and non-A as orthogonal departures from any A. The antinomy of A is then anti-non-A. If we reverse anti-non with non-anti we get a chiasmic reversible configuration. This distinction between the chiasmus opens the square of contraries and contradictions like a book. Two such books produce a cube. In other words if we have B then there is an anti-B and a non-B which produce together both anti-non-B and non-anti-B. These open up into another book which may be the dual of the first book-like configuration of the opened up Greimas square. What is significant is that for each non-element there is a second complementary pair of opposites. Thus the key is to understand that the non-X of the tetralemma is minimally another pair of the myriad natural opposites of creation. This is how the meta-system of the myriad opposites are produced as complementarities of complementarities of complementarities, etc. So A produces anti-A and non-A which opens up into anti-non-A and non-anti-A while B produces anti-B

and non-B which opens up into anti-non-B and non-anti-B. But we see that the non-A equals the anti-B and the non-B equals anti-A so that B is in the place of the non-anti-A or its chiasm and also the obverse is true, i.e. that A is in the place of the anti-non-B or its chiasm. And so the complementary opposites participate in a chiasmic reversibility with each other that gives us a cube. In that cube any of the sides of the cube can be seen as the spine of such a book with the opposite side of the cube being the spine of the anti-book. In the Greimas cube, an idea that Greimas himself did not come up with to my knowledge, there are multiple interfering chiasmic reversibilities that arc across the inward "substance" of the cube. We consider this "substance" to be of the nature of Wild Being as defined by Merleau-Ponty. We consider the two ways of looking at the opposite books to produce two way intaglio, i.e. intaglia from each direction. It is like intaglia etched into spun glass. The pattern is complex and chaotic like the pattern of the mandelbrot set, which appears at the dissipative level, raised to the quaternion level and then the octonion level. In other words there are mandelbrot like formations both at the quaternion and octonion levels and these chaotic and complex sets produce global patterns of infinite complexity that represent the nature of the interfolding of the chiasma of reversibility at the Wild Being level.

Once we have posited the Greimas cube at the center of the reflexive level and established a model of Wild Being there which is the next higher meta-level of Being beyond the reflexive special system, then we can see that it should be that nested within the autopoietic special system is a

space of Hyper Being, nested within the dissipative special system should be a space of Process Being, and nested within the real system should be a space of Pure Being. In other words we can read back down the hierarchy and expect that at each level the special system is creating a space for the next higher kind of Being. To reverse this and ascend we can see that where there is self-recognition there is Pure Being. The difference between what is reflected and its self-recognition establishes this ontological difference. Subjects recognize objects, and each other as objects (I-it ala Buber), and self as an object (I-id ala Freud). But when we put up another mirror then an infinite regress is produced and there is a process of seemingly infinite reflection. The recognition cannot be completed, but in fact all the images interfere with our recognition process. The repetition of representations, and the representation of repetitions produces a process state that appears as the space between the two mirrors. We now know that this establishes a tetrahedron which is the simplest three dimensional figure. This figure is stable. But it is connecting what is reflected, the two agents, and the two self/other recognitions. This is of course equal to the difference between percept and concept. So for instance the difference between the gestalt/system//flow/process and proto-gestalt/meta-system//proto-flow/meta-process might apply to this difference. In fact each schema as a perceptual and conceptual face. When we recognize the self, or other, we do so using the schemas²⁰. By schemas are meant what Umberto Eco calls the mathematical or

dimensional schemas and not the more specific schemas of kinds of objects or specific objects. See Peter Gärdenfors' Conceptual Spaces: The Geometry of Thought²¹ for an excellent treatment. In fact the schemas are a pure projection that unfolds from the projection of the dimensionality of space itself. We can think about this in connection with dreams. It turns out according to Robert Bosnak that the part of the brain that is active in dreaming is where simultaneity in orientation in space is embodied. So in dreaming there is an activation of a part of the brain that allows different things to simultaneously exist and act in space. What allows this to be expressed? The Schemas! The schemas define the kinds of things at each emergent ontological level that can be filled in by content. Did you ever dream something that could not be specified by a schema? In our dreams we meet others, who we did not know before and interact with them. We do not know who these others are. The others are many times creatures like ourselves, or animals, or monsters, or jinn. What ever they are they are forms forming, filled with patterns patterning, within systems systemizing, or meta-systems meta-systemizing, etc. We focus on the others that are like us animate beings. But many times we are captivated by the patterns, or other sorts of forms, or other sorts of systems, or other sorts of meta-systems that are not directly related to the animate beings like ourselves that inhabit our dreams. The key point here is that schemas allow a multiplicity of simultaneous figures or images at the same ontological emergent level. We are projecting schemas in our sleep when we are dreaming, and we are

²⁰ See <http://holonomic.info> for working papers on General Schemas Theory

²¹ MIT Press 2000

projecting them when we are awake. When we wake up, however, we temporalize the dream into a sequence from its network of simultaneous nodes associated with affect. The dreams are like the images we see in the mirror, which are different from the images of the things in the intervening space between the mirrors. Temporalization of the simultaneity of spatial affect-image nodes collapses into a primal time. For instance, the lost origin and the utopian ideal future collapse into the mythos. The mythos is the fourth realm besides past, present, and future ecstasies. It is the nowhere outside the causal horizon of the lightcones in Minkowski spacetime. Past and Future collapse into the Preterite, or Complete tense in Old English. The mythos appears as the Orlog. Mythos and Preterite are two forms of absence that is contrast with the present. Between the present and the absence is Es Gibt (It Gives). Underlying the Es Gibt is the Er-eignis, the owning/happening/appropriation. And thus we enter the cascade of the roots of Being specified in Primal Ontology and Archaic Existentiality. The simultaneity of the dream is the primal temporality that flows from the roots of Being. Central to that is the Bheu, or the Beon, i.e. Being the fundamental sense that is related to physus and logos. There is an enframing of the form (Sein/Seyn) Es/Er//Bheu//Wes/Wer. The Sein/Seyn differentiation is between Presence and Absence, Fiction and Truth, Illusion and Reality, Identity and Difference. For instance, in the Divided Line of Plato there is the difference between sensation (presence) and image (illusion). This is the side of precept that is related to the flux of Heraclitus. On the side of concept there are both representable and non-representable intelligibles. These intelligibles are made

possible by giving preference to identity over difference, or truth over fiction. Thus Plato's source forms produce identity by pervading all the particulars that share their properties. Thus the poets are excluded from Plato's cities. What appears as representable intelligibles are the non-duals order and right. What appears as non-representable intelligibles are good and fate. Plato sets up the concept of the Idea as a unity of presences of the same. Jung turns this on its head to give a theory of Archetypes as the totality of the absences of the same. This begs the question as to the nature of the totality of absences of the different, or the unity of the presences of the different. Difference is suppressed. Absence is suppressed. Fiction is suppressed. Illusion is suppressed. Only the positive aspects other than reality are supported in the Metaphysics of Presence founded by Plato called logocentrism by Derrida. The key point is that the philosophy of Presence of the Idea is a certain symmetry breaking of the aspects of Being. But this symmetry breaking occurs with the inflow of temporality that differentiates itself from the primal temporality of spatial simultaneity. By a series of symmetry breakings the various ecstasies of temporality, like present, past, future, mythos are created. By a series of symmetry breakings the aspects of Being are differentiated and take on different weights in the logocentric metaphysics of presence. These symmetry breakings give us consciousness as we experience it within the Western worldview in the Metaphysical Era. Dream as dreamed as lived imagination is primal temporality which is spatially simultaneous. This primal temporality also underlies waking consciousness. But in waking consciousness all the symmetry

breakings influence our way of approaching things in the schemas. In dream there is a pure projection of the schemas, which are fully transformational due to their simultaneity. That simultaneity of channels of lived primal time are conjuncted according to the mathematics of hyper-complex algebra. When we wake up there is an attempt at a synthesis which is put together like channel surfing. Consciousness scans the stack of simultaneous transparencies that represent the various channels of primal supra-rational ecstasy. Consciousness tries to make a narrative of it and thus throw it into the structure of differentiated sequential time. The dream state is like negative dimensionality. It is a locus of sources and these sources are structured by the Pascal triangle which differentiate in terms of the hypercomplex algebras. But the opposite of the negative dimensionality is the positive dimensionality in which the schemas unfurl. The stalagmite and stalactite of the positive and negative Pascal triangles relate the primal temporality to the primal spatiality within dream. These structures unfold into consciousness via symmetry breakings of temporal ecstasies and aspects of Being. We are aware of existence which is modeled by the special systems that interleave with the kinds of Being. We are conscious of the types of projection that we find at the meta-levels of Being. We must look at Consciousness of Being as intentional and Awareness of Existence as non-intentional. Primal Temporality as simultaneous spatiality underlies both waking and dreaming consciousness. The twin Pascal triangles appear as underling both. But in dream content is generated out of affect rather than by the perturbation of consciousness by sensation. Images directly connect to the body schema which

embodies affects according to Bosnak. In dream we recognize others and ourselves. In lucid dreaming we become conscious of our dreaming itself. So there is self-recognition within the medium of the dream. The dream is on the other side of the mirror. Consciousness is dreaming perturbed by sensation. Dreaming is consciousness lost in simultaneous networks of affect. We carry the mirrors within ourselves. We recognize self and other both inside and outside ourselves.

Keep in mind the distinction between waking and dreaming, and between non-trance intentional consciousness and trance non-intentional awareness in waking states which is a repetition of the primary distinction within consciousness. These two distinctions give us two mirror like reflections within our total awareness. These two mirrors when connected to the two mirrors of the Other give us a fully reflexive space with just two people. This is why the *Mysterium Conjunctus* is the alchemical model of the reflexive realm. We don't need four actors because each human being has two compounded mirrors within themselves. But we can still climb to the next level where there are three actors in a space of three inwardly facing mirrors because the couple of the *mysterium conjunctus* has a child. Now the interesting figure of the Oedipus/Electra complexes are produced. But as Deleuze and Guattari show in *Anti-Oedipus* these complexes are degenerative states. This is a kind of reductionism to a single mythos when in fact there are many different mythic frames that the child can be placed in within the multifarious family situations that arise. What is interesting when we look at the conjunctions of self-recognitions is that the

geometrical figure that is created between the three actors within an enclosure of three mirrors is an octahedron. The octahedron is between three mirrors that form an extended space and so the octahedra can be stacked and they can represent a dialectical structure that unfolds in time. That dialectical structure can be seen to have a core of a helix of tetrahedral. So the tetrahedral of the two mirror / two agent model is encapsulated by an other dialectical unfolding of a stack of octahedral. Octahedra are figures that do not block and so there is an ultra-efficiency produced at this level as the dialectic of unfolding Spirit (Geist) appears. The three strands of the dialectic infolds at the end of the set of octahedra and travels back down the core of the tetrahedral helixes and then reconnects to the outer octahedral dialectic. This figure is called the kosmic atom in theosophic circles. This is what we know as the conjunction of the Kosmos and the Monad schemas. In other words the time flow in the tetrahedral configuration is in the opposite direction as that in the octahedral configuration that surrounds it. Together they form a single time loop. This is like a pair of mobius strips or a kleinian bottle. That relates it to the pentahedron that appears in four dimensional space. The ambiguity between local and global characteristics applies mentioned in the first part of this paper. This ambiguity is exactly the kind of state that appears at the level of Hyper Being where indecision rules. So the appearance of the dialectic with its ultra-efficacy (efficiency/effectivity) of the octahedral structure is accompanied by the appearance of differance (differ/defer). The space within the ultra-efficacious octahedra holds the Differance of Hyper Being. As we move up to the next level we are in a space

where there are four agents within an inwardly mirrored tetrahedral space. The inner space is cubic and as we have said related to the Greimas cube which in turn embodies the chiasmic reversibility of Wild Being in the form of the difference between non-anti-X or Y and anti-non-X or Y. The two complementarities form a book and an anti-Book where in one the anti is privileged and in the other the non is privileged. At each level the special system produces an inner space in which the various kinds of Being can be expressed. This breaks down into either the mirror house with its warped mirrors of the fun house if we turn to paradox. Or it breaks down into the supra-rational state of the higher dimensional interpenetrating polytopes where the mirrors are seen to interpenetrate. Supra-rationality or Absurdity are two different ways of looking at the meta-system. If we are trapped in three dimensions then the mirror house is the only answer. But if we live in a higher dimensional realm, say the four dimensions of spacetime then supra-rationality becomes a possibility. When we say simultaneous spatiality that spatiality can be higher dimensional to accord with our embedding in an at least four dimensional kosmos. If we believe string theory that may translate into a ten or eleven dimensional spatiality. And certainly our schemas theory suggests as it follows the unfolding of the Pascal triangle that these higher dimensions are realized as higher order schemas in our experience.

The schemas are an expression of the dimensional framework of primal temporality which is spatially simultaneous. The Pascal's triangle expresses the simplest polytope in each dimensional unfolding. Schemas unfold directly from the

simultaneous spatiality of primal temporality, the temporality of dreams that then get expressed in waking by the symmetry breaking of temporality and of the aspects of Being. Spatiality is multi-dimensional in this case. Simultaneity means supra-rationality. When this is brought into consciousness that is when paradox is produced as consciousness tries to linearize the simultaneity, but also as time is spatialized by our metaphoric framework as noted by Lakoff and Johnson. Time is made like space and space is made like time as primal temporality is broken up and dream is transformed into waking narrative. A similar but lesser type of interchange probably occurs as we cross from trance into subjective/objective dichotomous consciousness. This is why Kant talks about the schemas in terms of modes of time.

The dream realm is a glimpse of super consciousness. It is the realm of Vishnu who dreams the world. Albion who is the dreamer of Blake's four Zoas. Hun Tun who is the amorphous and ambiguous wholeness of our existence as explored in Primal Archetypal Wholeness. It is a realm deeper than Apollo/Brahmin of Jung or the Dionysus/Shiva of Nietzsche. Beyond that is the realm of the dreamless sleep where angels roam and from which prophecies manifest. When we pop out of dream we take the simultaneous higher dimensional spatiality and temporalize it. But we take the temporality of dream and we spatialize it. Thus the time of consciousness is the space of dream and the space of dream is the time of consciousness. The schemas are the fulcrum between these two. By the unfolding of the twin Pascal triangles the dimensionality of space and the discontinuities of time are produced. They

are the framework on which our projections occur. They are rooted in the negative dimensionality of the hyper-complex algebras. Their positive dimensionality gives us the levels of the schemas, each of which participates in two dimensions. One dimension is the bump fitting into the next higher dimensional schema and the other is the hole that the next lower dimensional schema fits into. For instance Form is of dimension two and three. Pattern is of dimension one and two while System is of dimension three and four. So Pattern of dimension two fits into the hole of form of dimension two. Form of dimension three fits into the hole of system of dimension three. Pattern fits into the contour lines that indicate outline of the forms as shapes, as seen in the prehistoric cave paintings of France. Forms are three dimensional with shape and behavioral components. These are related to each other through the system which can be seen as static or dynamic with a fourth dimension of time. The system can be seen as at a minimum the static relations between forms in space. But when we add the fourth dimension we see the forms behaviors within the dynamic relations of the dynamical system. The schemas are nested and express the relation of system to meta-system between each adjacent level.

Schemas appear as a non-dual in the inter-transformation of time into space and space into time. The Pascal triangle gives us the simplest polytope in each dimension. The dimension is specified by its simplest regular object. Primal Time is the simultaneity of the schemas in space. These are conjuncted temporal streams. The undercurrent of these streams in primal time run backward as Ingvar Johansson says in *Ontological Investigations* as seen in short term

memory. These backward running streams of primal time produce the Orlog, the layering of temporal traces. When we transition to consciousness and the primal time goes through symmetry breaking then we get the appearance of time running forward like a narrative as seen from the perspective of long term memory. Primal time as multidimensional simultaneous negative dimensional spatiality becomes the static space of positive dimensions within which schemas encapsulate content as the intentional morphe is projected on the hyle, or qualia of consciousness. But also the negative space of dream becomes time differentiated ecstasies of time. We see time which is equivalent to existence through metaphors of space. Time by itself, i.e. primal time, without the complementary spatial metaphors is unthinkable and thus existential. Spatial metaphors allow time to be linearized and that allows the symmetry breakings to occur that give the separate ecstasies of timespace (past, present, future, nowhere=mythos). Timespace is the dual of Spacetime which is three dimensions of space plus linear time. These two complementary duals together make up the Matrix. Schemas at a level deeper than the difference between dream and consciousness. They are embedded in the Matrix as its fundamental structure prior to the transformation of time into space and space into time. Dimensionality and Epochality are duals. Epochality refers to emergent events. Each emergent event creates an epoch or era, like the transformation from the mythopoietic to the metaphysical. Emergent events can occur at a whole series of levels, i.e. fact, theory, paradigm, episteme, ontos, existence. Schemas and Emergent events are duals. Schemas are ontological emergent levels

which allow simultaneous spatiality. Emergent events are discontinuities in time that allow completely new configurations of characteristics to appear. The other hierarchy is the ontic hierarchy of the physus. This hierarchy which is discovered by science is triangulated between the emergent hierarchy of the social and the ontological hierarchy of the schemas. The ontic hierarchy is what cannot be reduced by science. It is composed of levels like string, quark, particle, atom, molecule, macromolecule, cell, organ, organism, social group and gaia. The schema hierarchy is controlled by skepticism. They are the schematic of things that stand up to skepticism. If you deny patterns, forms and systems then you cannot see anything at all. Emergent levels of social or individual information or knowledge are what arises from the background noise of nihilism. Logos and Nomos are the basis for discovering the nature of Physus in the Metaphysical era. Emergent events are structured by the kinds of Being. Each genuine emergent event must pass through all four kinds of Being. This makes us suspect that the schemas are organized by the aspects of Being. Schemas allow things to come to presence from absence. They allow things to have their identity. By the schemas we name things and describe them in language. Through the schemas we distinguish reality from illusion via testing regimes. So between the schemas and the emergent events we have both of the major characteristics of Being embodied. We apply these schemas to the various ontic emergent levels discovered in the physus by science. Between physus and logos is the nomos of order. Schemas are containers for ordering of things in space. So schemas give us a handle on things that allow us to

order them. Transformations at a particular schematic level are emergent events. If one form turns into another form that is an emergent event. One system turns into another system is an emergent event. What changes is the ordering of the content of the schemas, but the schemas themselves remain the same as a substrate to this transformation. There can also be types of change that render one schema into another schema at a different level but these are synthetic or analytic transformations. Emergent transformations occur at the same level of schema. Daphne turns into a tree. Each of these are a form or a system or a meta-system depending on ones point of view. Emergent events introduce radical discontinuity into the world. From the continuity of the world we need to step down through the kinds of Being to the level of existence where radical discontinuity resides. When radical discontinuities occur we see the infrastructural layers of the world as kinds of Being. But it is the aspects of Being that remain the same and that supports the structure of the schemas.

Conclusion

In this paper we have attempted to consider two possible foundations for reflexive sociology, one in mathematics and the other in ontology. Then we went on to consider the place of General Schemas Theory in this context. This is an exploratory work that tries to show that reflexive sociology has a natural basis in a kind of systems theory that explicates special systems in relation to the difference between systems and meta-systems. But that there is also another view that looks at the interleaving of the kinds of Being that differentiates the special systems. Schemas theory appears as the dual of the

emergent event, and as a non-dual between space and time providing a framework for the differentiation of both spacetime and timespace. We call this fundamental structure that mediates between these two four dimensional ways of looking at space and time together the Matrix. We find that this matrix is produced by Pascal's triangle appearing in both negative and positive versions which underlies the structuring differentiated articulations of dimensionality and temporality. This matrix structure underlies general schemas theory which is projected by Being onto things but encodes in itself also the conjunctive structure of existence which gives some hint of the nature of things-in-themselves, i.e. as void or empty. The key idea here is that Reflexive Sociology is an emergent product of the unfolding of Special Systems Theory and intimately related both to Autopoietic Theory and the theory of Dissipative Structures which are far from equilibrium negentropic orderings that arise from nowhere in nature. These special systems only become visible when we distinguish between the System and Meta-systems schemas, which are part of a broader hierarchy of schemas that include pattern, form, domain and world among others. Understanding the nature and origin of schemas necessitates the comprehension of the reflexive field of the socius, because the schemas are what gives intrinsic stability to the images and representations that are repeated indefinitely in that field. But also the schemas are the basis on which we cut through these repetitions of representations of the knowledge of others via mentalization. Schemas are *archetypal* in as much as we treat them as the totality of absent images (percept) of the same. Schemas are *ideal* to the extent we treat

them as the unity of present concepts of the same. The *essence (concept)* is the unity of absences and the *noematic nucleus (percept)* is the totality of presences. These both also refer to the *same* thing rather than the *different*. These give the parameters of the logocentric metaphysics. However what if these were to refer to the *different* rather than the *same*.

Schemas are *anti-idea* (percept) to the extent we treat them as the unity of present images of the different. Schemas are *anti-archetype* (concept) to the extent we treat them as the totality of absent concepts of the different. Schemas are *anti-essence* (percept) to the extent we treat them as the unity of absent images of the different. Schemas are *anti-noematic* (concept/noematic) *nucleus* to the extent we treat them as the totality of present concepts of the different. Here we see how second order difference transforms our concept/percept differentiations.

Schematization is the basis of the ramification of images within the reflexive field of the rhizome of the socius within the realm of fourfold mirroring that appears at the level of the reflexive special system. Within that space Wild Being or the Magma (Castoriadis) appears. This magma is forged into various recognizable things via the schemas, where by it becomes patterns, forms, systems, etc. The magma is forced up into the level of Hyper Being which is created by the three fold mirroring that supports the ultra-effacacy of the dialectic that revolves around the fundamental undecidability discovered by Godel and exploited by Derrida calling it Difference. From the intrinsic propensities are forged traces. Then these fundamental

undecidables are forced up to the level of Process Being which is encased by the double mirroring ramifications to infinity, that differentiates finite. At this level time and Being are mixed. Finally the fundamental flux/process is forced up to the level of Pure Being where it is fixed as what persists, i.e. the a priori. At this level illusory continuity has become fully forged. This is the level where ideation appears. The archetypes are seen as sources within the meta-system which is the source of the magma. So this movement is from a totality of absences to a unity of presences, but of the *Same*. Essences and Noematic nuclei reverse the relation between the two ends of the spectrum. Essences puts unity in the place of totality and noematic nuclei put totality in the place of unity. Here we see how Jung's archetypes are merely a reversal of Platonic Metaphysics that points at the sources rather than the origins. Phenomenology that concentrates on essences and noematic nuclei and bracket the ideas and archetypes is another sort of reversal. But this begs the question of what happens when we replace the same thing with something different. In this case we enter the realm of the philosophy of difference which was inaugurated by Heidegger, carried on by Derrida and carried further by Deleuze in Difference and Repetition. One way into this arena is to ask what happens when we substitute the different for the same in each of these formulas which have the form the unity/totality of presence/ absence of the same/different. By this we enter the dream realm, which is after all at the root of waking consciousness, dream underlies trance that underlies the subjective/objective discriminating intentional consciousness. Here we see anti-

ideas that are percepts, we see anti-essences that are percepts, we see anti-noematic nuclei that are noetic, we see anti-archetypes that are conceptual. In other words there is a shadow world that dogs the meta-physical world of identity which is a world of difference. The problem of the philosophy of difference is that it has not freed itself of the terminology of identity. But it is difficult to invent a way to describe difference that does not ascribe to the concept of identity, as Deleuze heroically tries to do. However, if we realize that this shadow realm is the complement of the other realm then we can use the complementary concepts/percepts to those that define the metaphysics of presence (Sein), or that of absence (Seyn). What is crazy is that Deleuze uses the term Idea for the anti-archetype in Difference and Repetition. This leads to no end of confusion. He says that Ideas as problematics are fields of multiplicity and heterogeneity to which answers are point solutions. These solutions must be the anti-noematic nucleus which might be called the noetic nucleus (percept). The anti-essence is also a percept and he defines that by way of the idea of virtuality of the differences between the faculties. The anti-idea is a percept and can be thought of the repetition as opposed to the representation. So Deleuze attempts this great reversal of logocentrism and the archetypal realm at the same time by substituting the aspect of difference for the same. Nathan Widder in The Genealogy of Difference attempts to show how this view can be applied to the history of philosophy with some success. Jeffrey A. Bell in The Problem of Difference: Phenomenology and Poststructuralism also attempts to show how this philosophy of difference was

generated out of the Phenomenology of Husserl and its interpretation by Merleau-Ponty. However, if we do not understand the structure of the field of the aspects of Being it is difficult to get a grip on the reversals that Deleuze is making to the field to produce the philosophy of difference, and how it does not leave metaphysics behind. These are similar to the kinds of radical reversals of Plato that Nietzsche attempts when he substitutes Reality for Truth as the basis of metaphysical thought. These reversals of metaphysics, such as Heidegger's emphasis on Absence rather than Presence still leave us within metaphysics because it only changes the relations of the aspects of Being to each other. They all continue to operate within the realm of the aspects and kinds of Being. But schemas as projections of pattern, form, system, etc reside within Being as a priori or persistent or always already structured aspects of space and time. They differentiate things in space such that they can be simultaneous in time. They allow the transformation of space into time and time into space as we move from the dream realm to trance to subject/object differentiating intentional consciousness. Schemas are the dual of the emergent events that appear though the transformation of the content of one schema into the content of another schema at the same level of the ontological hierarchy. Emergent events move through each of the meta-levels of Being. Through emergent events we access primal time that is non-differentiated. Access of primal time, sometimes called *FLOW*, re-enlivens our lives and makes the world new again. It breaks all the reifications and melts our alienation, dismantles our anomie. Understanding the full panoply of the

transformations of metaphysics allows us to understand the philosophy of difference and how it fits into Platonism, Nietzsche's views and Jung's views that transform Platonism in various ways. The schemas are pivotal in all these transformations and become visible through them as non-duals within the magma of the chiasm at the center of the Cube of fourfold reflexivity at the center of the inwardly mirroring tetrahedron that appears at the reflexive social level of the unfolding of the special systems between system and meta-system. The ontological hierarchy of schemas is inherently social. They go together with the emergent hierarchy of information in the individual and the levels of emergent knowledge change in society. Between the emergent social/individual hierarchy and the ontological hierarchy of the schemas the ontic hierarchy of the physis appears within the history of scientific discovery. The ontic hierarchy allows us to see the non-reducible levels of closure that are socially invented and constructed in our interaction with the designated as real material world. But ultimately all these levels are constructed out of magma which according to Lawson becomes reified as different kinds of closure of the openness of the clearing of Being. Closure results in material and texture. Material is a certain type of reification where noesis and noema are set for a time, tentatively until they are reset by some emergent event that reaches deep enough to touch the essential openness again. The texture is the certain kind of openness that remains in spite of a tentative closure. Material and Texture have emergent properties specific to their form of reification. But under the influence of an emergent event other properties might become emphasized while still others might

become de-emphasized. The schemas are the a priori containers that reification occurs around as a differentiation of spacetime or timespace of the matrix. Schemas are social projections. Durkheim said that Kant's categories were socially constructed. Here we say that so are his schemas. The social construction of the schemas are itself social in the sense that forms interact with forms, systems interact with systems, meta-systems interact with meta-systems, etc. In other words the basic containers of what can be social are set by the schemas. They are a differentiation of the realms of possible social interaction. While on the other hand the emergent social and individual hierarchy are the levels of knowledge production at which emergent events can occur that transform these schemas. Out of that interaction of time and space we get the differentiation of the physis as the ontic hierarchy, which appears as the non-reducible forms that underlie the social and the meta-social or the society of societies of the species called gaia.