ADVANCED MONAD THEORY FOR MONAD ENGINEERS

Chapter 8 of the Anti-thesis

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None yet.

Exploring The Monad Schema

Leibniz's monadology can be seen as the prototype for all subsequent attempts to define the monad schema. Of course, the atomic theory of Democritus is the original archetype of this approach to things, which gained legitimacy with the advent of modern atomic theory, where it seemed there were some ultimate building blocks of things. Unfortunately this has broken down with the discovery of particles, quarks and perhaps strings. Each successive layer is seen as made up of monads of one kind or another. So the history of the monad schema is that it keeps getting pushed lower and lower to become smaller and smaller entities, with no seeming end in sight, just as there seems to be no visible end to the universe on the macro scale either. Leibniz however tried to take another tact and to define monads in terms of qualia of perception and making them the substance of the soul. Thus Leibniz is a quasi-phenomenologist who says that the limits of our senses in terms of content is where the monads are to be found and that the differentiation of the qualia of the senses is what we are in our essence. This move of Leibniz is reminiscent of the idea of Observers that we have just been dealing with. In the last chapter we had a vision of observers being an Emergent Meta-system between the four hierarchies that define the World, i.e. social, individual, ontic and ontological which exist between physus and logos as finite and the absolute, i.e. Being. What we would like to do in this chapter is to explore this image more carefully using Leibniz as a guide to the introduction of a monadology in terms of perceptual content rather than in terms of objectively minute monads. We follow the phenomenological convention and bracket anything that is not directly apprehended, like atoms, particles, quarks and strings. These are constructs that are built up on the basis of phenomenological evidence. By content we mean content of perception which is used to form patterns in perception. But we recognize that these concepts of things-in-themselves that are beyond perception are in effect idealizations

of the perceptual contents which are projected beyond the limits of perception based on scientific reasoning. So these ideals are related to the monads of perception as their conceptual counterparts. Thus it is a good idea to keep both sorts of monads in mind as we think about monads. Just like with the system there were conceptual and a perceptual counterparts. So to it is at each level of the schemas, and thus it is also true here.

As an appendix to this chapter there is a commentary on Leibniz Monadology. That commentary shows that Leibniz had in the back of his mind the concept of the Special Systems and the Emergent Meta-systems in some form as the basis of his systematization of his philosophy of monads, the universe and god. It is possible that this conception came from Muslim philosophers of preceding eras from whom the Westerners learned their Greek philosophy. Specifically from the concept of temporal qualitative atoms of the dominant Ashari school of theology. The concept of temporal atoms was created to reconcile Aristotelian Philosophy with Islamic Dogma about the absolute power of God over creation. It suggests that in each instant the whole universe is recreated by God in the form of temporally limited qualitative atoms. This is the one part of Ashari theology that Shayk Al-Akbar Ibn al Arabi the great mystic sufi affirmed and incorporated into his own way of looking at the relation of creation to God. It is useful in explaining miracles and there is a specific *ayat* (verse, sign) in Quran that is referenced as showing that this interpretation is correct, i.e. the *ayat* about Bilquis' throne which is brought by a man of knowledge in the blink of an eye, which is to say that the universe was recreate by god in the presence of Suliman, rather than transported though space and time. The metaphysics of Leibniz has an uncanny resemblance to this idea of temporal atoms which was a standard part of Islamic theology, which by the way could have come from former Buddhists who

became Muslim, because it has also a striking resemblance to certain forms of Mahayana metaphysics and is like nothing that we know from the Greeks. For Democritus atoms were eternal but this caused fundamental problems for Islamic Theology, so this concept of momentary creation and destruction of the universe in a time period less than Planck's constant presumably, is an excellent intellectual approach to solving this metaphysical problem. Leibniz probably learned it from the Muslim philosophers, similarly many of Descartes positions have a strange resemblance to positions of Al Ghazali. This borrowing of early Western philosophers from the Arab intermediaries is a part of our philosophical tradition that is normally ignored, where borrowed things are considered inventions of the borrowers and not traced fully to their original sources. Similar types of bias are found in tracing things to Greek sources but ignoring middle eastern connections of these Greek "inventions" to earlier cultures like Sumeria or Egypt[1]. However, this haunting of Leibniz by the earlier Arab tradition, what is striking is how exact the formulation of the Special Systems and the Emergent Meta-systems is in Leibniz monadology. It can be clearly pulled out of his monadology if you know the special systems theory. I had read Monadology several times but never saw it until I read it this time having learned the theory. In the commentary I show where I think the Special Systems and Emergent Meta-systems theory appears. This is a very significant finding because prior to this I had only seen hints of it in the work of Kierkegaard and Plato. But in Leibniz the representation is much clearer. So this gives a more solid grounding for the theory of special systems in our own tradition. And Leibniz philosophy is a major influence on Deleuze so that is where many of the aspects of Deleuze's philosophy that resonate with Special Systems may come from.

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[1] See Black Athena

Now given this grounding within the philosophical tradition, in Plato[2] and in Leibniz we can use this leverage to begin to consider the philosophical grounding of schemas theory in general by taking the theory of monads as a basis which we have connected to observation theory. We can also use some of the ideas of Nietzsche as well, especially his ideas of how subjectivity is really fragmented into a swarm of instincts. Deleuze seems to be taking these various hints within the tradition as the basis of his striking out in a *different* direction. We can take his book Difference and Repetition as a case in point of an attempt to begin to build a philosophy based on these alternatives which approximates special systems theory in as much as it identifies the same emergent levels as become apparent in special systems theory, much the way Jung does in his psychology. With these various resources we can begin to think of a New Monadology which builds a theory of the Special Systems and the Emergent Meta-system from scratch which is more coherent because the mathematical basis in hyper-complex algebras and other aspects of mathematics may be used as a guide. The New Monadology would specifically use the mathematical structures as a framework upon which the philosophical concepts would be hung to elaborate the implications and meanings that flow from Special Systems Theory. Here we are following the lead of Grassmann who was a mathematician who did more than merely point out mathematical structures, but attempted to interpret the significance of those structures. Grassmann discovered the whole realm of mathematics that we are talking about, but his work was ignored until recently because it was considered too difficult at the time. But now we have rediscovered again the form of mathematics of vectors and matrices and can now appreciate what he had done from the beginning. However, he did not merely stick

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[2] See Fragmentation of Being and the Path Beyond the Void by the author.

to the math but did something anathema to most mathematicians today, he played the role of a philosopher as well and attempted to glean the significance of what he had discovered. This is our concern as well. That is why we claim to take the math as a framework for the building of extensions to systems theory that result in its transformation into schemas theory. In the schemas theory we see the meaning of the mathematical structures. This meaning is very practical because it is these very schemas that we as engineers project in our design work. We have also shown how the math, the schemas, and logic must all work together in our understanding of how to apply these templates of understanding. Normally math, logic and the schemas do not mix but are considered specializations to themselves the boundaries of which few dare to cross. However, if we do not cross those boundaries then we are left with a fragmented view of the world. Each type of knowledge has its place and its interplay with the others to give us a whole picture of the articulation of the worldview.

We have already mentioned Difference and Repitition. In that book Deleuze attempts to make a major shift in our understanding of the role of Difference in our tradition. It seems analogous to the concept of Derrida called Differance. Both Deleuze and Derrida climb to the third meta-level of Being and are building a philosophy at that level. Later in Anti-Oedipus I believe Deleuze with Guattari goes on to the fourth meta-level and attempts to anchor his philosophy in Wild Being. But at this point the philosophy of Differance and Repetition is explicitly at the third meta-level of Being. In this book a major distinction is between repetition and representation. I believe that this distinction is equivalent to the one I have been making between set and mass approaches. Particulars in a set are representations. Instances in a mass are repetitions. Deleuze recounts all the strange characteristics taken on by repetition as a concept within the tradition. But much of this

strangeness has to do with the suppression of mass ways of looking at things in favor of representations. One major difference is that representations have essences (constraint structures on attributes) while repetitions have no essence. This is something that makes repetitions extremely strange to us. And we can see that clearly, if we look for instance at repetitions on ceramic pottery of different cultures and compare that to representations on pottery, for instance on Greek black and red ware from antiquity. A representation has an essence which all the aspects of the figures cohere to convey, but merely repeated lines, or simple patterns do not convey. We get a meaning from a representation that we do not get from something repeated to produce a pattern. This difference has a lot of ramifications in the Western tradition which has come to see repetition as the other, and representation as the self. This is similar to the distinction that Derrida points out between speaking and writing, where the tradition is logocentric emphasizing speech and making writing into an other. Thus as other repetition and writing comes to signify Hyper-Being in all its strangeness. A similar thing can be said about set and mass. Our mathematics ignores the possibility of a mass category that is the dual of the set category. It is just not there in the mathematical categories and we would miss the possibility completely if other cultures had not explored this possibility and so by comparison we can discover this blind spot in our own views of things which suppresses stuff. We view stuff as something taboo, and like most taboo things we do not even know they are missing because they are never mentioned. Mary Douglas in Purity and Danger has written eloquently about the role of dirt as a Taboo. Dirt is stuff. But the second law of thermodynamics assures us that it will always be with us. But when we construct systems theories, philosophical systems it is precisely the dirt that we seek to get rid of and part of that is just not mentioning it. So we start to see a distinction between Representation, Set, Speech,

Cleanliness on the one hand and Repetition, Mass, Writing, and Dirt on the other. The first is associated with consciousness and the second with the unconscious. The point is that although the second set is taboo we need it to have a whole picture. It is like where in G. Spencer Brown's Laws of Form he gives us laws but suppresses the anti-laws we only get half the picture. We need the more complex picture that includes both laws and anti-laws and that allows us to move between them. We must introduce diacritical marks that tell us whether we are in the land of the laws or the anti-laws. Those diacritical marks are dirt, they make the formalism messy and in fact force us down to the structural or patterned level. But without both laws and anti-laws working together it is impossible for something to arise from the void and gracefully return to the void. In fact if you use only one you get stuck and cannot return to the void without retracing your steps exactly back the way you came. So the book Laws of Form is lopsided and malformed by this simplifying assumption that just leaves the anti-law possibility unexpressed as a hidden assumption which is not even explained. The dirt of the diacritical marks that differentiate laws from anti-laws has been swept under the rug. This is what has happened in our whole tradition with the emphasis on speech and representation, i.e. epic over writing and repetition, i.e. lyric. We have all of Homer but most of Sappho has been lost and it is no accident that one is male and the other female. This split is also seen in the relation of the positive metaphysical fourfold (heaven, earth, mortal, immortal) to the forgotten and suppressed negative metaphysical fourfold (chaos, covering, night, abyss) that can be traced back to the Ogdad in Egypt which are mapped to masculine and feminine respectively. There is quite a bit of recent scholarship by women concerning misogyny in Greece that carries through the unfolding of the western tradition where the women are made to bear the stigma of the suppressed metaphysical elements of the culture as well

as many trials and tribulations not endured by the males within the patriarchy. So this distinction runs deep and the part of it that Deleuze is concerned with is that which shows the relation between conscious and unconscious. Repetition and obsession is something relegated to the unconscious while representation is something which is seen as wholly conscious. For instance, we saw in Observer theory that everything was a representation. There was no element that could be seen as related to repetition. Perhaps that is why memory and imagination were suppressed in Observer Theory which we see Leibniz addressing in his Monadology. There is a lot that could be said about this fundamental distinction that Deleuze is making which is necessary because Differance or Hyper Being has been more or less lost in the oblivion of the unconscious for so long that the only way to bring it to presence is to delineate the frontier of that province where we sweep all the dirt, what Jung calls the Shadow, i.e. the things that the ego does not want to admit about itself. As Deleuze does we almost have to bring to bear different theoretical voices in order to get a complete picture of how this distinction plays out in the tradition and effects our work understanding Schemas Theory and Special Systems Theory. Because what we note is that the Special Systems and many of the Schemas have also been relegated to the dust bin of history. Their knowledge has been lost and has to be brought back into the light, so the horizon of the unconscious, of oblivion plays an important role in our re-understanding of these concepts. In fact, what we find is that these concepts define that boundary itself. The ego is the restricted economy and the unconscious self is the general economy. The archetypes talked about by Jung are the thresholds of organization identified by Jung as archetypes between the totality of the self and the unity of the ego. In other words the suppressed knowledge of the special system is what organizes the distinction between conscious and unconscious. The forgotten organizes the distinction between what is remembered and what is lost in oblivion.

And here we breach what is a fundamental lesson for Systems Engineering. At this time Science and Engineering disciplines are living in a world defined by the Enlightenment. That is a realm in which all is the light of reason. They are bound within what Horkheimer and Adorno call The Dialectic of Enlightenment. They use Odysseus being bound to the mast and rowed by his crew past the sirens as a metaphor for enlightenment. In other words the emphasis on the light of reason and the sweeping under the carpet the passions leads to a nihilistic situation, where Odysseus can hear the Sirens but cannot act, while his crew can act, keep rowing, but cannot hear the sirens. The Sirens are the passions. Horkheimer and Adorno say that the elites allow themselves to indulge the passions while they keep everyone else in servitude to the slavery of reason. This fundamental nihilistic archetypal situation appears in multitudinous ways within the enlightened society because they have drawn a distinction between reason and the passions and have suppressed the passions. Romanticism as defined by Schlegel is precisely the celebration of everything that enlightenment suppresses. Now with respect to the relation of science to engineering we see this split. In other words, engineering is seen to be the one who follows science applying the knowledge that science discovers. The passion for the discovery of new knowledge is denied the lowly engineer. The engineer is bound into the reasoning laid down by the scientist who heard the sirens song of nature and has interpreted it for the engineer. I follow the lead of Bruce I. Blum in Beyond Programming to insist that engineering and science cannot be distinguished in this way and that engineering is every bit as creative as science, and in fact you cannot do science without doing engineering, just as I would insist that you cannot do engineering without doing science. That is why it woeful that so few engineers

are trained in scientific methods and ways of analysis. The requirements of a system are a hypothesis, the design is the formulation of an experiment based on a theory, and the testing is the experiment. Science and Engineering are the same thing in a different guise and the myth of social stratification caused by enlightenment is a false picture of both science and engineering. But as the romantics say there is a lot that both science and engineering, master and slave, sweep under the carpet that they consider the dirt of existence. And so they conspire to hide from themselves all sorts of things, like the things associated with writing, repetition, dirt and mass. We need to bring those things relegated to the unconscious, called passions to light as well as breaking down the master slave relation between science and engineering. This is what the post modern viewpoint has to contribute to this process of transformation of science and engineering. The goal is to make Systems Engineering a rigorous discipline like Software Engineering which in turn wants to be like other more well established Engineering disciplines that Mary Shaw talks about when she discusses the stages of becoming a rigorous engineering discipline. These stages have to do with the assimilation of science into the foundations of the discipline. But this desire to become "real" engineering comes at a time when the limits of science itself are being recognized and the enlightenment model is being questioned due to the things it suppresses and the unnecessary dualities it engenders. These suppressions and dualities come back to bite us in the end in unintended consequences. So what we would advocate is a broader view that would see systems engineering gain a broader conception of itself than merely just another discipline attempting to gain respect by following the enlightenment model. It can only do that if it recognizes that there is a dark side to the enlightenment that is not always obvious. For instance, it can give up the master slave relation between itself and science which is in fact a myth. It can seek to incorporate higher

levels of theory and grow into a Schemas theory and practice instead of relegating different schemas to different disciplines. It can try to make more permeable the line between conscious and unconscious in order to make sure that what is suppressed will not come back to haunt it later. In other words discipline and rigor that is aspired to should be ameliorated with a recognition that there can be too much of a good thing. Part of this broader view is the recognition that Mass orientation toward stuff is just as important as Set orientation toward things. In fact, the emergent properties that arise out of design and instantiation in execution come from a transition between set and mass orientations so that you cannot understand emergence without the addition of mass concepts to the already established set concepts. Thus the suppressed repetition and writing elements that Deleuze and Derrida bring to our attention merely become the dual formalism to that we are already using and both formalisms together give us a complete picture rather than continually coming up to the edge of the world and encountering an inexpressibility we merely switch to the other formalism and then get the benefit that Bateson talks about in Mind and Nature in which he points out that two sources gives better quality information than one source. By suppressing Mass we are really only degrading our information that we allow ourselves to have. By seeing repetition and writing as mass we bring it into a realm of something understandable and that we can directly relate to language in terms of mass and count constructs with respect to nouns. In other words when we allow mass to be formalized as part of our language of design, what was once a mystery becomes just the Category Theory corollary that you get by reversing the arrows. It is similar to allowing the anti-laws in Laws of Form to be expressed and used marked by diacritical marks, suddenly you see a whole where you formerly only saw half of the picture and things start to make sense that did not make sense previously.

This is a fundamental repositioning of ourselves with respect to our discipline. It allows us to glimpse the future of the discipline where engineering cannot be separated from science nor philosophy. It envisages a future that is like today's string theory in physics compared to Newtonian science of the enlightenment. In our discipline we have not even advanced to the point were relativity theory and quantum mechanical like theories have appeared, less well envisaged deeper theories like those of string theory. But if we read System Engineering within the context of contemporary mathematics, contemporary logic, contemporary science, contemporary postmodern philosophy, then we get a completely different picture of future possibilities where Systems Engineering with its foundation in System Theory is transformed into Schemas Engineering with its foundation in Schemas Theory and that theory is related to Logic and Math and functions in a hierarchy of social and individual emergence that we attribute to science, with an understanding of the worldview that is philosophically sophisticated. And within the context of that Schemas Theory there is a recognition of the importance and peculiarity of Special Systems and the Emergent Meta-system meta-schema. This is the future path of Systems Engineering that I am trying to envisage here. One part of that is focusing in on Schemas and attempting to understand the whole hierarchy of them as a basis for Architectural Design. Because of their place in the hierarchy of disciplines the Engineer normally will not learn about Philosophy or Science except peripherally in school. And because of cultural reasons it is unlikely that they will read much about them after they get out of school. Engineers tend not to read outside their disciplines. They are encouraged to be insular and are so by nature in most instances. For instance, Bruce Blum's book[3] which talks about Philosophy

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[3] http://www.ercb.com/ddj/1996/ddj.9608.html

of Science as a way to get into the subject of Software Design is very rare. So a lot of the things that I am talking about here is beyond the pale for the majority of Systems Engineers, and that will be the case for many years to come.

Philosophy of Engineering

But there is a reason to pursue this line of investigation, and that is that not only is there isolation of engineering from science and philosophy, as well as math and logic. But there is also the reverse isolation. In other words scientists and philosophers need to know something about engineering. That is not a subject that many of them engage in. And because of that there is ignorance of technology, of how things in the built environment are actually created. But presenting Systems Engineering in a more sophisticated light, we actually might attract some interest in Engineering to those who consider it beneath them even though it supports their lives in myriad unrecognized ways. There is a process behind all the artifacts that appear within the build environment and that process is engineering. That process builds the experimental instruments and the class rooms in which they are used. Part of the split we are talking about is between Academia and Industry, which is the way that Logos and Physus are represented and enacted in our cultural on a macro-social scale. Science for the most part hides on the Academic side of this divide away from the Engineers who slave away on the Industrial side building the things the Academics need to do their knowledge work. Engineers work under patent rules that give the results of their work to the corporations that employ them. This causes them to become anonymous when compared to the academics in science that live and die by the reputation that they engender by their writings and other works. There are many structural social differences that enforce the master slave relation between science and

engineering in our culture. However, we need to rise above these dualities and recognize that Systems Engineers are in a good position to contribute toward the development of systems theory and science in general because they are continually using the schema in a way that the scientific community is not. The scientists are implicitly recognizing the schemas in nature, but the engineers are designing things according to the schemas. Every design is a test of the schemas efficacy. This aspect is completely lost in Science. It is in fact the other side of the coin which is needed to fully appreciate the schemas. Schemas can remain implicit in science because they are not using it per se, while in engineering the schemas are themselves being used as the basic templates for designs to be fashioned out of. Between these two uses of schemas Schemas theory should arise that is useful both for recognition and implementation of schematic templates. Robust Schemas theory needs to bring Science and Engineering together. Thus theory and practice need to be married for a full fledged schemas theory to be successfully created and used. Scientists just do not run into the problems of Design and testing of designs in the same way that engineers do. Design is the form in which the schemas become manifest in our daily life. The fact that they are implicit in perception is significant. But when we move into the realm of action then these implicit organizations underlying perception lead to tangible results. Alexander, the inventor of the pattern language, tries to tell us that there are good and bad designs of the lived in landscape. He tries to codify the patterns of good design and justify them beyond mere aesthetic grounds. He talks about a Quality without a name that pervades a good design. But it comes about through the orchestration of the patterns of forms. I think that is significant. It is in patterns of forms that the quality without a name becomes manifest, i.e. by turning the schemas upside down. Unless you know the schemas and their relations to each other it is difficult to make

this transformation that might reveal the quality without a name. The Chinese called this quality without a name the Tao, i.e. the Way. How do we bring this quality without a name to systems engineering products. First we must separate architecture from engineering contracting as Eberhardt Rechtin would like to do. But then the architect must appreciate the schemas and their relations to each other that inform his design. Then perhaps by turning the schemas upside down he might get a glimpse of the Quality without a name in our culture. It has no name because we have suppressed the knowledge of the void or emptiness out of which all schemas arise and to which they return in the Emergent Meta-systems process. In our culture we only recognize essences at meta-level two (process being) and meta-essences at meta-level three (hyper being) but we do not normally recognize what exists at meta-level four (wild being). What there is at this level the Chinese call Chi and Li, Subtle Infoenergy and an Organizing Principle. For us there is a quality without a name, because we have suppressed this level of Being on the frontier of existence. But for the Chinese this was the level that counted because it was closest to the void of existence. It is the relation of the forms to Chi and Li that produces the quality without a name in our culture, i.e. gives rise to our apprehension of the Tao, or Way. We normally think about schemas as something fixed with Pure Being. The idea that they may be produced out of observers and that this is part of an Emergent Meta-system dynamic takes us into the realm of Process Being. In that realm we see that the schema is an essence, i.e. a constraint on attributes of things, that we project. When we objectify it with our theorizing we turn it into a concept, i.e. a template of understanding that is idealized which we render as Pure Being in our representations. But if we ask what the meta-essence of the schemas are then we approach its manifestation in Hyper Being. The schemas unfold out of each other by a series of emergent jumps. The meta-essence controls

how the schemas relate to each other and unfold out of each other. Much of what we have said about the interrelations of the Schemas to each other tells us something about their nature in Hyper Being with respect to their meta-essence. But what about the meta-meta-essence? We do not talk about that level of transformation. It is hard to think about. But one thing we know is that it has to do with the embeddedness of the schemas in the phenomena in its individual actualizations. In those embodiments the schemas correspond more or less closely to the noumena that they are rendering present or absent, identical or different, true or false, real or illusory. The phenomena itself is always unique under the transparent surface of the schema that is projected onto it in order for us to understand it. Chi and Li address this uniqueness that is more subtle than the meta-essence. Chi is the infoenergy of the phenomena as it first appears out of the noumena in wild being. That infoenergy is unbounded in some sense and the schema attempts to bound it. We call the unbound nature of the noumena as it first appears magma following Castorialis. We project categorizations onto that unbound infoenergy in order to tame it but for a moment it remains wild. In that wildness there is a unique imprint called Li. Li means the veins in Jade. Li is the force that causes the rings in a tree to be laid down just as they appear in the growth process. As the wild infoenergy is tamed it lays down rings of reification. The Li is the organizational principle that gives that thing its unique patterning and it is the result seen in the layers of growth. Physus and Logos both unfold, i.e. have meta-essence. But the Li is the uniqueness of the unfolding in every specific instance which is best exemplified by the Tao, or the Quality without a name in our culture. It is from the Li that the exceptions and anomalies occur that allow us to change our theories as a result of experimentation. All the panoply of peculiarities in each instance are Li. They are covered over by our statistical methods and fuzziness. We call their results vague. This

subtle level of the propensities of things beyond possibilities, probabilities and determinancies is a key to understanding the schemas as they operate in relation to science. Science can only go forward based on uncovering anomalies which appear at the level of Chi and Li that appear between the unfolding schemas and the noumena. Likewise Engineering should be concerned with the Chi and Li because that is what allows the designed produce to have quality without a name which adheres to the Tao, and thus is properly designed from all points of view. With the concept of Chi and Li we stretch to the limits the concept of the "schema" in its application in situ to specific and concrete cases in design or in recognition of things or stuff. We separate out aesthetics from engineering more radically than it is separated out from science. Even in science they admit that the aesthetics of a theory is many times an indicator of its truth or depth. But in engineering we relegate aesthetics to architects or interior designers or human machine interface or ergonomics specialists. Only the designers themselves admit that for designs to be correct they must also be aesthetically pleasing. But aesthetics is another discipline that needs to be brought together with science and engineering and recognized as a vital component to anything that humans must live with. Bringing in aesthetics means dealing with Chi and Li and approximating consciously the quality without a name which we need to give a name in our culture as the Chinese have when they refer to the Tao. Engineering is a drab discipline when you compare it to Science or Architecture. We don't even have to compare it to the Arts and Artistic Design disciplines. Must it be so drab? As humans I think we can admit to the importance of aesthetics in everything we do, although it shows up so seldom in actual cultural artifacts. But that is exactly where an appreciation of Wild Being leads us. Because it is by recognizing what is aesthetically out of place that may lead us to recognize anomalies and exceptions that will have a

major impact on reconfiguring our understanding of the ontic in the physus hierarchy as it departs from the inner organization we projected upon it using the schemas from the logos.

We get a picture of the schemas that they are not just determinate idealized templates of understanding, but there is the process of their projection which constrains the things that appear in perception and cognition, but also they unfold from each other allowing us to traverse from one schema to another, and finally they misfit the noumena upon which they are projected in such a way that occasionally we get a glimpse of the magma, that something else beyond our projections that makes life more than we thought it was and thus makes things interesting. Part of that making of life interesting comes from showing us our blind spots, like the duality between set and mass and bringing us into confrontation with what we have communally suppressed. Part of what we have suppressed is the special systems schemas. Not all the schemas are out in the open to us as we might expect. Leibniz knew about them, but who else from our tradition knows. We find images of them in other traditions but in our own there are only some few hints in the history of alchemy and assorted other taboo subjects. Jung seized those hints and made them the central part of his psychology of the collective unconscious and the realm of the psychoid (i.e. real things that exemplify archetypal structures synchronistically). Special Systems is a lost part of our tradition clearly understood by Plato, Leibniz and Kierkegaard but few others at the philosophical level. In terms of Science and Engineering they are completely lost in oblivion except for a few anomalies here or there. In this work we are bringing together those anomalies in Math, Logic, and science to attempt to make these hidden schemas more visible, because they are the basis for the organization of the rest of the hierarchy. They tell us something about ourselves and our own hidden nature because

it is we that project them unbeknownst to ourselves. If nothing else we must attempt to understand the Special Systems so that we can better understand ourselves, because through them we encounter the threshold of the unconscious as it is represented to consciousness. The unconscious is there behind every recognition of things or stuff in the world and behind every design. Sometimes it causes disasters. Sometimes unintended consequences and side effects. It is insidious and haunts all our actions in the form of Murphies Law. It appears unexpectedly in a mocking form like the signs that Killjoy was here. All we have to do is look at the long line of project disasters that are recorded in engineering history and we see that the successful projects are victories won at a high cost and are few in relation to the failures that are scattered across the beaches of history. When we are looking at those failures from the inside as we take part in yet another Death March[4] then we know what the face of the collective unconscious looks like. Facing that horror and recognizing that it is there beyond our projections of the schemas is crucial to our understanding how to negotiate victory out of defeat. Those who need to face the unconscious most are those who have denied it most vehemently. These are the children of the enlightenment in our midst foremost of whom are the scientists and engineers.

Can there be a philosophy of Engineering? There is philosophy of Art and philosophy of Science. Together with Art and Science, Engineering makes up the third leg of the stool of the tradition. Art is creativity in Logos; Engineering is creativity Physus; Science is creativity in the non-dual realm between physus and logos, i.e. in the realm where order connects theory (logos) and experimental results (physus). This hearkens back to the three part differentiation of the Philosophy of the Speech of Presence (logocentrism), i.e. the speech of the epic

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[4] Ed Yourdon

poet into three realms, Nature, Craft and Resemblance. Plato denigrated the resemblances created by art because they did not do anything useful. He held up craft in an honored place because it created things that went beyond what nature offered but used nature in novel ways. Nature of course was the touchstone of truth, and of course the true is what is straight. Nature was unadorned and thus the best measure. Engineering starts as the creative part of craft. Then Engineering begins to support commercial practices and becomes the institution of production and manufacturing. Finally Engineering begins applying scientific findings and methods and becomes a professional discipline whose practitioners are schooled in the ways of science but apply those ways to practical purposes. Engineering is the embodiment of Practical Reason rather than Pure reason. Practical reason has its origins in the *Metis* of Odysseus. But note that there is a shift here, because we said above that Engineering represented creativity with regard to physus but it mixes with craft which eventually becomes science as the non-dual between physus and logos. Science comes when craft, which in old English means power, pulls free of the production of goods and turns to the production of knowledge. Thus we get the adage knowledge is power. Science is dependent on leisure, i.e. freedom from merely providing the necessities of survival. Science is a product of what Bataille calls the Accursed Share. Science is a product of the excesses of the meta-system directed using those excesses to produce knowledge. So where there is some mixture between science and engineering in as much as both are born from craft, these are distinguished from art which produces resemblances which are not useful, or pure aesthetic experience. So the real split if there is any is between science/engineering and art for arts sake, i.e. creativity that pulls free of any goal, even the goal of producing knowledge. Nietzsche of course turns Plato on his head by placing his emphasis wholly on Art. He also turns Plato

on his head by emphasizing the real rather than the true. Nietzsche tries every possible inversion. Heidegger explains this very well in his second volume on Nietzsche. This is Logocentric metaphysics of true presence which Plato advocated that Nietzsche was doing his best to over turn. However, he actually remained within its orbit by merely reversing some of its terms. Deleuze is attempting a more radical overturning but is still remaining within its orbit in his focus on another aspect of Being, i.e. difference. The real overturning of the logocentirc metaphysics of presence is through the escape from the aspects of Being all together into existence which is interpreted in terms of emptiness or void, i.e. going beyond the four kinds of Being into Ultra Being. I order to get there we have to realize that this distinction between the three realms: Engineering, Science and Art merely is an image of the physus/non-dual/logos distinctions at the heart of the Western Worldview during the Metaphysical era. In effect there is no real distinction between these disciplines. Engineering should be considered the same as Science *and Art*. All these are species of creativity and all are ultimately striving to produce emergent events. Art wants to shock the sensibilities. Science wants to produce new knowledge. Engineering wants to produce things with emergent effects which are useful. Engineering hearkens closer to our embodiment. In that sense it is the most conservative. It is the last bastion of the enlightenment mind. Where Science has passed through the Newtonian phase to embrace Relativity and Quantum mechanics, Engineering is for the most part still dealing with a Newtonian world because that approximates the world we live in. Where Art runs out to embrace Postmodernism and test its limits Science remains attached to critical and conservative analytical philosophical ideals which recognize the limits of non-computability or undecidability or relativity or incompleteness. But Engineering has not yet moved into this critical phase in which it questions its own

foundations. Rather it remains dogmatic assured that the foundations are there to be found if we merely looked for them hard enough. But can a philosophy of Art and a philosophy of Science be radical enough if they do not consider the philosophy of Engineering? Rather we need to provide a comprehensive account that brings Engineering into the twentieth century from a philosophical point of view out of the nineteenth century so we can approach the new twenty-first century we are now in. One thesis is not going to be able to do this work, especially since it is unlikely to be read by Systems Engineers, less well Systems Theorists. But there is a certain sense in which if we open up the site and begin construction it still changes the conditions within which the discipline operates. Philosophers need to recognize that Engineering is along with Science and Art a worthy philosophical subject, because it is part of human experience and provides an essential type of support for the lifeworld. In fact, the invisibility of Engineering is the invisibility of the ready-to-hand, i.e. of technology as an infrastructure itself. A whole realm of endeavor is lost if we do not consider engineering as a subject along with science and art. It is one of the blindspots of our culture, one of the biases, that go along with the metaphor of the enlightenment. We only care about Odysseus not the men of his ships who die namelessly often precipitated by is going to sleep. Odysseus is the Artist or the Scientist who have a chance to claim fame for their work, while engineers mostly give their work to others anonymously through their employment agreements. There is little fame in Engineering. Yet when we explore the built environment and consider global environmental impacts we see the effects of the engineers work ubiquitous around us everywhere, more ubiquitously than either art or science. So philosophy that leaves out engineering but yet treats art and science is lopsided.

On the other hand does Engineering need

philosophy? The answer is clearly no. Pragmatic concerns are all that matter in this arena. Yet no philosophy is still an unconscious philosophy. One of the things we need to do is explore that unconscious philosophy and see its inadequacies. Those become apparent when we consider the environmental impacts over the centuries from poor engineering decisions which were not far sighted enough. We only need to mention one example, the automobile and its impact on global warming. These inadequacies are innumerable. Now like the scientist the engineer claims that his work is neutral and that it is merely a matter of the use of his work by others which is not his own responsibility. However, this defense seems to hold little weight when the results threatens the engineer and his own heirs as well as the rest of the population of the earth. Do we allow leaders out of war crimes trials because they say they were merely following orders? We assign responsibility for the most heinous crimes against humanity. So we need to consider the anonymous engineer and his responsibility as well. When we start to consider assigning responsibility for the possible destruction of the species and in fact myriad of other species, then I think it is time engineers awoke from their slumber like Albion and began thinking about things a bit more deeply. But of course this is just my opinion, obviously not shared by the multitudes of engineers that populate the globe and ply their trade. So here we attempt to think about that which is most unthinkable. The philosophers are not interested in engineering because they are the surfs of the world of creativity. The engineers are not interested in philosophy because they see all their concerns as pragmatic and are not interested in how their beliefs and reasons inform what they do unconsciously. But if we follow Foucault's lead then we must see that it is precisely in these backwaters that the interesting things are to be found. As Foucault says you do not study the leading lights of the tradition but the secondary sources which give you some

insight into the episteme of the discourse regimes. He deals with madness, sexuality, the clinic but he has not dealt with the engineering professions. Here the discourse is the artifacts we see all around us informing our lifeworld and giving us the supporting infrastructure that makes our contemporary was of living possible. The discourse regime of engineering is in some ways even more pervasive than those related to madness, prison, and medicine. Each of these speaks of limits of mundane life. But the invisible support for daily life comes from engineering of artifacts that support our daily mundane actions themselves. So in a way Engineering is even more fundamental than the various discourse communities that Foucault studied. The point of Foucault's studies is to show us that these discourse communities have a strange genealogy, not what you might expect. For instance, in Mary Shaw's research into engineering she saw that first there is craft, then commercialization and then accommodation to science. Now we notice that craft has some element of art, because each thing that is built is unique. Of course, Systems Engineering is clearly in the craft stage like Software Engineering that Mary Shaw is considering the development of along the tracks of becoming an established engineering discipline. Software Engineering is ahead of Systems Engineering in that regard. But still both are in the Craft stage. Neither has come to terms with mass production. What is needed for that is to become accomplished in the ability to reuse system components from system to system. Kinds Theory we considered in the last chapter is a step in that direction, as are other product line approaches. But it is interesting that craft is aligned with art and that in order to approach science it is necessary to go through a mass production phase. Now mass production is a form of repetition. Thus repetition mediates between art and science in Mary Shaw's proposed path to a true engineering discipline. Notice how we keep coming back to the same set of elements: representation verses repetition,

science verses art verses engineering. Is this the true course of engineering? Foucault would have us consider the history of engineering and how engineers saw themselves in various stages in the unfolding of engineering as a discipline. That genealogical history of engineering is yet to be written, and this thesis will not be it. But even if we do not understand the genealogy of engineering which led to various historical changes in our living circumstance including those brought about by war and the important role in war played by technology, it is still possible to treat Engineering as a discourse community and consider its relation to technology which has according to Heidegger the essence of nihilism. Fandozzi reviews this argument in <u>Nihilism and Technology: A Heideggerian Investigation</u>. This is one aspect of Engineering that we have as yet only touched upon, which is the fact that Technology is the product of Engineers and Philosophers consider the essence of Technology to be nihilism. So from this point of view Engineers are the producers of preeminent nihilism in our culture. This is quite an indictment and I am sure if Engineers knew of it they would protest. However, it suggests that Engineering Philosophers, if there were any would want to come to terms with this indictment of their profession as the source of the nihilism at the heart of technology. But of course since Engineers are not listening philosophers can say what ever they want about them. And most Engineers being pragmatic would merely ignore this kind of banter on the part of philosophers who never created anything useful in their lives. But when we start considering global impacts of engineering decisions then this criticism begins to take on more of a bite. And over time it becomes more crucial that we look at the truth of this accusation as philosophers of Engineering. As Fandozzi says it is really the fracturing of the perspectives that creates the nihilism. This is the core of the argument. This is to say it is the creation of domains of discipline and rigor which put out of their

consideration the whole situation, highlighting certain concerns and ignoring or remaining oblivious to others. Nihilism is produced by not being whole and taking a whole view of both the creative process and the product of that process in the total environment in which that product is going to function, especially the human environment, but also the environment from the point of view of other species. Well we have just been talking of how Engineering is split from Science and Art even before it separates out into its own separate sub-disciplines one of which is Systems Engineering. So we can see that this splitting thorough specialization is a real factor, so that perhaps the charge of nihilism production may have some basis in the practice of engineers. We note that specialization is according to Adam Smith one of the key aspects of industrialization in general. The engineer if he is the slave of the scientist is still the master of the manufacturing engineer who in turn is the master of the manufacturing workers. There is in fact a whole food chain which supports the industrialization process, i.e. the culture of repetition which denies the uniqueness of the individual items, i.e. the level of Wild Being. Against this chain stands the artist who attempts to hold up a mirror to the industrial culture or offer an alternative vision. However, in general Philosophers and Artists do not understand the nature of Technology and Engineering because they only experience its artifacts supporting their lives, not the creative process of engineers themselves, or the culture of their workshops. That silent voice needs to have its own say about the nature of technology, the ethics of global impact of engineering decisions, the nature of engineering creativity in relation to other types of creativity. When we understand that voice then we will have reached deeper into our own oblivion and understood ourselves more deeply.

New Monadology

So if we are to consider where to begin again to should be by defining a New Monadology, which attempts to build upon Leibniz's understanding of the Special Systems and the Emergent Meta-system and add to that the understandings of Plato and Kierkegaard, as well as what ever can be gleaned from other cultures and even discredited sciences like Alchemy if they give us insights into the peculiarities of the Special Systems and the Emergent Meta-systems that cannot be derived from more credible sources. We are dealing here with a lost knowledge that we can glimpse in fragments here and there throughout our tradition and the traditions of other cultures. What we are bringing to it is an organization from mathematics, and appreciation of the role of logic, and strange physical phenomena discovered by science that give us metaphors for the strange systems. We are attempting to marry Systems theory and Systems practice together and expand them to a General Schemas Theory and Practice that might become a basis for human creativity whether it be in Art, Science or Engineering. However, we see a need in Engineering for the understanding of these types of systems because it is engineering which produces the built environment that encompasses our lifeworld, and these special systems are images of us and ordering living systems. In other words one of the main reasons that Engineering needs to be cognizatant of Special Systems and Emergent Meta-systems is that these are a more accurate descriptions of the human and other species that the systems are being built to support in practical ways. We build the environment using the normal schemas but the special schemas describe those for whom the environment is built. The relation between the special systems and the other normal schemas is the relation of the inhabiting one to the habitation. Thus Special Systems theory should be of utmost concern to Engineering. The Engineers should understand not just the systems they create and how they fit into the environment (meta-

system). But they should understand the nature of the domains that split and produce nihilism within the technological infrastructure. They should understand the world because they are making the furniture of the world. They should understand the kosmos because they are relating not just to the physical universe but are providing the infrastructure for an interface with the kosmos itself, i.e. our anthropocentric view of the physical universe. The same is true of the other schemas, what Deleuze calls *The Small and The Large* following Plato. Engineering should understand not just the schemas that it is projecting as part of the design process but also should understand how the social organisms interface with that environment which is what is given by the Special Systems Theory.

A good place to start in that respect is with a New Monadology because the monad is the ultimate building block which serves as the basis for the normal schemas as well as the emergent meta-system. But how do we begin to define the monad? We have seen various definitions up to this pointing terms of perception, affectation, observer, memory, imagination and the soul. Interestingly enough the definition in terms of soul of Leibniz has a certain ring of truth, because the monad and the soul are both indefinable invisible. The soul is opposed to the spirit. Soul is the breathing while the spirit is the breath itself. Soul is related to the sea so it is a mass concept. Spirit is a count like concept related to unity. The soul takes on a very rich set of meanings under the hands of Jung, Hillman and Geigerich and has a very long genealogy within our tradition. But whether monad is similar to the indefinable soul or the incomprehensible spirit is hard to say. The point is that in the schemas we are defining something imperceptible that goes along with perception, which organizes perception from the inside in a way we do not notice until we see it appear within our discourse communities of our specialties which eventually we try to draw out as a

separate discipline because we notice that it is the basis not just of perception, but theorizing about things, as well as the design of our built world. It functions in Art, Science and Engineering mostly unrecognized. We are so busy looking at the things we do not notice our anthropomorphizing of the things and the stuff. But if we think of it as soul stuff or spirit things then we probably come closest to the mark, because that tells us that when we reflexively see the schemas within our perceptions, cognitions, and designs that we are looking at a reflection of ourselves. The Special Systems gives us a model of the interface with the unconscious within ourselves in which the subconscious mind and the environment within which it is embedded conspire to give us a priori comprehensions of things before and within the things themselves. It is only in our a posteriori analysis of our discourse about things that slowly the image of these transparencies begins to appear as through a glass darkly. We start seeing the distortions of our windows onto the world rather than merely looking though the window to see the things beyond it. Now it is interesting that we really don't have something halfway between the mass-like soul and the count-like spirit: an ipsity of juxtaposed conglomerates rather than a set of things or a mass of stuff. We would if possible like to delineate the monad as a non-dual. Of course, we will be reticent to define it. We have learned from Jaspers and Heidegger that a definition is the conceptual death of any term. Rather we need to set up contexts in which the term can be given implicit meanings through context rather than denotations that will suffocate it. Thus ultimately we will not define the monad. That is one reason we like the idea of relating it to soul and spirit and of pointing beyond those to the ipsity which is non-dual between them. A more complex rendering might be to adopt the nine ply Egyptian version of the aspects of the person. In other words this fragmentation of the self can be taken to different levels of complexity

beyond the basic split between the two parts of the self that live on after death seen in many cultures. In China they are called Hun and Po. One goes into the heavens and the other into the earth. They are the complement of the Olympian and Chthonic gods, i.e. the Titans which are projected outward from the pure inwardness of soul and spirit (which means something different from Hun and Po but is likewise a duality). Thus we can see the archetypes of the Greek gods, or Sumerian, or for that matter the Egyptian Ntr, as the total differentiation of the plurality of the soul in relation to the unified spirit. But that does not take us to wholeness. There is a Primal Archetypal Wholeness[5] that rings in the ipsity juxtaposed in a conglomerate which is the *barzak*, interspace and barrier, between Hun and Po, Soul and Spirit, Mass and Count orientations to things and stuff. That *barzak* is modeled by the special systems and together with the normal system produces the emergent meta-system within which appear the seed in the pod, the monad in the swarm, the view in a constellation, and the candidate in the slate which inter-transform into each other governed by different algebras as they cycle around the various realms which we have seen correspond to the four hierarchies (ontic, ontological, individual and social). If we can think of the monad as this ipsity between and before the arising of soul and spirit, or the nine elements of the self of the Egyptians or the various faculties of the mind posited by the masters of the enlightenment, or what ever other fragments there are of the self then we may have made some progress in our conception of it. The monad as ipsity of juxtaposed conglomerates, in other words each ipsity is a conglomerate in a conglomerate that is non-dual between set and mass, spirit and soul acting as the non-dual connector yet differentiator of the inherent duality of the eternal, or of mind and body, *hun* and *po*, etc. We don't have a word

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[5] Palmer, K.D.; Primal Archetypal Wholeness, manuscript 2002

for it, but in the Hindu tradition of the Bhagavad Gita it is called *Bodhi* and in Buddhism it is called *prajna*. It is an indefinite Primal Archetypal Wholeness beyond the various kinds of wholeness of definite form.

There is a particular model that I would like to discuss now that I particularly like which is that of Jahn and Dunne in Margins of Reality. They take the quantum model of the atom as the model for consciousness. They use from that the idea of quantum tunneling as their metaphor for Extra Sensory Perception. They explain that we cannot effect any one event with our will but we can effect myriads of events by shifting the mean of the probability distribution. If we will it to shift then for some they get exactly the opposite of their willing, others get what they will, and others get no effect so that communally the effect washes out and becomes a normal curve. What I like about this model is that it uses our understanding of the microscale quantum mechanical structure of the atom, i.e. a version of the monad, to explain the relation between mundane consciousness and ESP, but also between consciousness and matter, one of the great mysteries of quantum mechanics. What we would like to add to this scenario is the concept that macro quantum mechanics is also true of the world. The world is quantum mechanical through and through and our Newtonian world is an illusion which is the result of the projection of Being. Given that point then we can see that if we combine the paradox of quantum phenomena with the paradox of the qualia brought to our attention by David Chalmers, then we get a quantum and qualitative world within which the monads exist, in which their relations to each other is described by quantum tunneling and in which they form a reflexive set of dissipative special systems which produce autopoietic intermediate configurations. But that this is also a mass-like field. And between the mass-like and count-like visages of the phenomena of the self as apprehended

by the shattered "I" there is the non-dual ipsity of the monad that exists juxtaposed in conglomerations of conglomerations that support complementarities of complementarities, and some of these complementarities are not just two way but n-way as Arkady Plotnitsky has said in his book <u>Complementarities</u>. This is an interesting vision of the monad. It does not explicitly call on any faculty, such as perception, cognition, etc. It does not define them as agents, or observers, or participators. Rather it leaves the question open as a problematic as to the true nature of the monad, but appeals to their non-dual nature and holds them up as a non-nihilistic distinction in the face of the nihilistic extremes of set and mass, spirit and soul, hun and po.

The concept of the quantum tunneling gives us a prototype for solving the problem of how the monad knows what is going on inside other monads. It is a metaphor for what is known as the Theory of Mind in humans, i.e. how humans know what other humans know. This concept of how the interior of one monad communicates with another in the swarm helps to explain the swarming behavior of the monads despite their apparent closure. They are closed but not all the way. Previously in my work I have named systems such as this *openly closed* systems and have given the psychology of Victor Frankl as an example of someone who defines such a thing. But you can also give Kant as the source of this problematic which was ultimately resolved by Husserl, the answer is essence perception which goes beyond ideation by opening up another dimension. Just as you can get out of a sphere though the fourth dimension without crossing or breaking the line of the sphere, so you can get out of the closure of the transcendental subject or object through the higher dimensions of Being. Heidegger exploited this secret door out of transcendental closure to the utmost degree by defining the difference between Pure and

Process Being where Process Being is seen as a higher dimension or a higher meta-level of Being than Pure Being. Openly Closed systems are closed like autopoietic systems yet at the same time open from the inside to other closed systems. That is to say given a strict un-crossable barrier such as that which Kant claims exists between ourselves and the noumena as Transcendental objects and other transcendentals, like God and other Subjects, then we can say that the whole problem becomes how do those closed entities communicate. They communicate via higher dimensions of Being which manifest through a phenomena like quantum tunneling, i.e. some unexpected secret route that opens up unexpectedly like the door that pops open in Fillini's *Juliet of the Spirits*. Monads must communicate with each other internally, i.e. via their non-dual connection with each other, despite their closure, i.e. though some four dimensional connection between their closed spheres. This means that they must exist embedded is some utterly non-dual medium that allows such a violation of their boundaries while also maintaining them. That medium is the void or emptiness, i.e. The existence that appears beyond Wild Being in Ultra Being. As we move up the ladder of kinds of Being this ability to violate the boundaries while maintaining them intensifies until at the level of Existence you get interpenetration of the monads which exist in a state that the Buddhist called the Jeweled net of Indra, i.e. where every monad reflects every other monad in their facets. Once we establish the *openly closed* nature of the monads, i.e. their approximation to the non-dual that secretly connects them despite their radical separation and closure, then we have established a basis on which to understand them.

The next problem is the fact that internally they are faceted while externally they are conjuncted into patterns as conglomerates. This seems a radical difference between the inside and outside unlike the system that has meta-systems inside and outside. In other

words in the monad there is a difference between inside and outside it seems. But wait, the faceting really may be a surface feature of the monad, like a jewel and perhaps the monad is patterned inside rather than faceted, perhaps the faceting like a jewel is on the surface of the monad. This then is important to bear in mind. Facets have monads on their outsides and insides, this tells us that the swarming of swarms of swarms is occurring in a regress where monads contains swarms of monads and so on indefinitely. Notice how the realization that facets contain and are contained by monads changes our perspective on them. It is as if the monads and their pure separation bracketed the faceting which was a form of fusion. We note that when we go down another level we loop the loop and have to consider the relation between the facets and the pluriverse, i.e. as David Deutsch says that the interference between multiple universes is quantum mechanical uncertainty. The facet is outside and inside the pluriverse. This is the medium for the communication between universes. Thus we can see that if we go up a level and see that the monad is inside and outside the facet it is a medium of separation and discontinuity that serves to moderate the effect of the connection of the facets. Then when we come up to the pattern which is inside and outside the monad then we see that a global view serves to connect again allowing us to see the forest for the trees. There seems to be an alteration of connection and separation working in the schemas in terms of inside and outside communication, which Leibniz rightly talks about as a mirroring, in which the two sides are parallel yet independent, yet mirroring each other. By this parallel mirroring of inside and outside the communication between inside and outside via higher dimensions is effected. So the disparity between inside and outside organization in the monad is created by the mistake of thinking the faceting is anything other than an articulation of the boundary of the monad itself.

Now rather than attempting to define the monad further, what we would like to do is cite a possible example of something which may be seen as a monadic ipsity. In this case the example is the "letter" used in writing[6]. We hypothesize that the letter is a non-dual between representation and repetition, between speech in logos and writing in physus, as such the letter (*harf* or edge in Arabic) is a good model of the monad. Now letters were not the first form of writing as is known from archeological evidence. The first forms were Cuneiform, Hieroglyphs, and Characters. Letters developed later as a simplification, interestingly enough in the Sanai between the lands of Egypt and Sumeria. Writing it is said developed from counters with representations of what was counted, i.e. precisely from a juxtaposition of representation and repetition. The counters are the repetitions, usually marks that counted quantities of things, or stuff written next to some representation of the thing counted. These tallies were thought to be the first written artifacts. There were also small counting beads of different kinds that could be manipulated by hand made of clay which were perhaps the precursor to the abacus, which were like little symbolic representations where were manually manipulated and counted and existed as representation. It is perhaps these counters that came first and then it was seen to be simpler to just make marks on clay tablets than to make the clay counters, which had to be manufactured separately. But here we clearly see the juxtaposition of repetition and representation which is seen as the first occasion for writing. Now writing itself went in two directions in the two major civilizations in the middle east. In Sumeria cuneiform developed in which the pictures disintegrated into nail marks, i.e. patterns of structural marks, while in Egypt, close by the pictures remained as forms of identifiable objects, even when used as letters. We have the interesting case of Ugrit in which

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[6] Palmer, K. Emergent Worlds manuscript

cuneiforms were used to represent letters rather than as ideograms. And in Egypt we have determiners which were the representations of the concept that was added to the letters. If we take these two examples we see that letters developed out of representation in Egypt using representations as the medium to stand for one, two and thee letter combinations that were arrayed like the counters over against the determiners. On the other hand in Sumeria the representations fragmented into the nail like drawings that were ideograms, similar to characters in China, which like the characters in China fragmented into structural components but which then were used to stand for letters as a whole, by picking a set of thirty cuneiform elements to stand as the letters. So letters come to us both from the level of pattern Sumeria and Mesopotamia and from the level of form in Egypt. It is not fairly well agreed that letters developed in the Sinai which lies between these two empires. Letters as I have said is non-dual between representation and repetition. They seem to have originated as simplifications of representations such as we find in the Egyptian cursive script. But they are simplified and connected to the phonetic depiction of the language in question. So unlike Egyptian they did not stand for more than one letter. But unlike the Ugritic they represented the letter using connected strokes. By the connection to phonemes they had a connection to the spoken word, i.e. the speech of logos. But by being traced by an instrument on a medium they connected to the writing of the physus. They were less complicated than both the Egyptian and Sumerian prototypes. And interestingly enough the alphabet was a set of different letters, yet these letters (monads) were repeated in many words (patterns) that in turn appeared in a syntactic relations that can be thought of as grammatical forms in the system of the sentence. These letters are repeated over and over again in different combinations, and in fact form a mixed mass of letters, where the letters are brought together over and over and intermingled in

the mass of the text. So a text is a mass within which narrative forms appear through the use of sentences pragmatically strung together. The letters produce a certain efficiency in writing and reading that cuneiform or hieroglyphs do not have, it abandons representations for mimicking spoken language, The representations become the sentences, which convey whole grammatical thoughts, i.e. packets of meaning. The writing immerses itself in the mixed mass of text, using forms of letters that are connected but simplified. The letter becomes a minimal representation that is then repeated in a way that mimics the phonetic structure of language, but which differs from it as well.

Letters are an excellent example of the non-duality of ipsity between set and mass. There is a set of letters, Ugrit has 30, Egyptian has 26, Arabic has 28, Hebrew has 22, etc. But these letters are repeated in patterns to produce mixed masses of texts. The letter approximates the spoken word but is written in the physus. Letters are more efficient than earlier modes of writing. Letters in their first instance combined both quantity and quality together in as much as they both stood for a phonetic value and a number. Later letters took on the role of variables in mathematics. When we think of letters we tend to think of something that we wish we could understand and give meaning to but which carries with it an arbitrary element and an opacity that lends itself to esoteric speculation but which can never really be pinned down for certain as to having any specific meaning. One way that people have tried to understand their meanings is to see what kind of words the letters appear in and try to gain an association by that means to a meaning. Another way is to look at the representations that they were taken from originally. There are myriad ways that we try to understand the meaning of letters on their own, but for the most part we find that these attempts are futile as they run into the lost origins of letters, and we end up making up things to

fill in this void of the always already lost origins of the letter. But letters in this way are excellent metaphors for the monad. The monad is just beyond our ability to see it, because we never see isolated contents outside the pattern. Thus the fact we cannot see the meaning of the letters is a similar feature. Letters are just beyond the horizon of meaning the way monads are just beyond the horizon of perception and the way the soul-spirit is just beyond the horizon of the body. Yet letters are the bearer of our culture and our symbolic communications at a distance, i.e. in the domains. Letters make up the text of the worlds, i.e. the literary cosmos. Even though they have no meaning themselves that we can isolate they carry all the meaning of our culture. Letters are elements of our perception, of memory, of imagination. They are the most fundamental signs of perception, memory and imagination. Our Observers (preceptors, rememberers, imaginators) can be seen as producing and consuming letters, as we see the more restrictive Turing machines recognizing them. They in fact play a crucial role in Computing as the ASCII code which overlays as forms the binary patterns at the bit level. Letters play a crucial intermediary role in our perception, memory and imagination of each other through time. As such letters are an artifact that mirrors the monad as its external sign. Letters are just as enigmatic as the monad itself.

We might take the Arabic letters as an example of how the letter system itself can be seen as having significance that cannot be pinned down to the individual letters. For instance in Arabic the source of the letters is considered to be a dot. This dot then elongates to become a line which is the *alif*. The *alif* is then articulated to become the *aliflam* and the *hamza*, i.e. crossing and discontinuity are added to the mix of possibilities of articulation. The next stage is the arising of the *Kaf*, *Lam*, *Ha* and *Mim* that are the four primal letters, unrepeated. After these are the other eight undotted letters that

have multiple forms. And finally there are the sixteen dotted letters. This unfolding of the Arabic letters allows us to get a glimpse of the way the letters can be seen as unfolding together. The dot is the origin of the letters to which is added movement in the alif. This movement is articulated by discontinuity or by self crossing. Then we get letters that are unrepeated and finally we get the repeated letters which are dotted. It is as if the Alif stood for symmetry and the individual letters stood for various kinds of asymmetry in the sense that Leyton uses the term. In the Arabic letters we can see a recapitulation of the move toward non-duality as we loose first repetition, then we find the letters that exemplify closed verses open, upward verses downward, i.e. fundamental oppositions, and finally we undo the possibility of discontinuities and self-crossing until we return to complete symmetry that then is returned to its origin. There are twenty letter forms that correspond to the twenty sources in the I Ching beyond reversibility and substitution. Thus the letters indicate sources beyond the origin point. These twenty sources are also seen in the Mayan day names. They are the twenty combinations of the four elements with the five Hsing (transformations). This is all to say that there are esoteric associations of the letters in a language like Arabic which are given meaning of a meta-physical sort as in the work of Shaykh Al-Akbar ibn al Arabi. Similar sorts of esotericism of letters can be seen in the letter alchemy of Jabir which revolved around the numerical meaning of the letters and their relations with earth, air, fire, and water as balanced in the number seventeen which was sacred in Egyptian numerology. These esotericisms of the letters show how people have projected meanings on the monads of the letters and attempted to reach their non-duality by getting rid of asymmetry as Leyton suggests, and then attempted to describe the sources from which the letters arose. This was made all the more appealing by the fact that in Quran the number nineteen plays such a prominent role

as an error correcting code. So there is seen to be a connection between the nineteen-twenty letters of the phrase "In the Name of God the Merciful and Compassionate" and the source forms beyond the origin of the letters in the dot. There is also the famous ayat in Quran that says in effect that set over the fire are nineteen watchers. Similar sorts of speculations abound in relation to the Hebrew language in the context of the Bible. The esotericism of letters comes from the fact that their intrinsic meaning is lost, always already lost as Heidegger would say. But as with the case of Arabic, this esotericism points to the non-duality of the letters and their exemplification of sources beyond the origin which we approach by getting rid of asymmetries.

When we look at letters as the example of the ipsity, between set (representation, speech) and mass (repetition, writing), we are attempting to point toward something that everyone is aware of that has the characteristics of the monad. However, we are also invoking Bennett's concept that … "The objects of perception are the minimal entities that can interact instantaneously with the observer.[7]" In Bennett, et al's Hypothesis 5.3 there is an assumption that

> "**Hypothesis 5.3.** *The objects of perception for an observer O have the same structure as O in the following sense: the objects of perception share with O that part of O's structure which defines it as an irreducible entity at the fixed level L of the given hierarchy of analysis. Stated succinctly, the objects of perception of O may themselves be represented as observers[8].*"

This is based on the following meta-proposition:

> "**Meta-proposition:** *Insofar as any two entities interact they are congruent: The part of their respective structures which is congruent delineates the nature and extent of the primary aspect of their interaction. Any aspect of the interaction which cannot be described in terms of this congruence is secondary, and arises from the propagation of the effects of the primary interaction by the internal flow of information within the separate entities.[9]*"

This meta-proposition allows us to speculate that congruent with the letters as conglomerated in texts juxtaposed in words ipsities there is a differentiation of the perception, memory and imagination of the reader and writer of texts, i.e. that the faculties at some level differentiates into isomorphic entities that relate to the letters. So that there are recognizers and observers of the letters in us at some subconscious level. And that the difference between the faculties at some level is homomorphism to the differentiation of the letters. From this point of view one can then understand the obsession with interpreting the letters esoterically, but this interpretation always misses the mark because the letters are monads, i.e. they are always beyond the pale of significance, they are opacities of the unconscious. However, if we think of the letters as having corresponding to them recognizers in the subconscious, and if we think of these differences in opacities of the unconscious has having a differentiation that relates to the differences between the faculties themselves then we have some hint of the relations of what Deleuze in Difference and Repetition calls difference-in-itself between these opacities of the faculties taken down to the instance of the letter to become perceivers of the letter, remembers of the letter, imaginers of the letter, cognizers of the

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[7] <u>Observer Mechanics</u>, page 75
[8] <u>Observer Mechanics</u>, page 77

[9] <u>Observer Mechanics</u>, page 78

letter, etc. Monads within us are like that, they are pure differences, process differences, hyper differences, wild differences, and ultra differences which stand against the pure identities, process identities, hyper identities, wild identities and ultra identities.

Meta-levels of Identity and Difference

ontic Difference[0] difference that produces elements of series

Pure Difference[1] series of repetition (Deleuze starts here)

Process Difference[2] difference between series

Hyper Difference[3] dark precursor[10] (differ*a*nce: differing and deferring)

Wild Difference[4] difference in itself[11] (Deleuze ends here)

Ultra Difference[5] non-nihilistic distinction

corresponds to

ontic Identity[0] correspondence, superimposition (Zeroth)

Pure Identity[1] tautology (Peirce First) correspondence to self, superimposition onto self

Process Identity[2] same, belonging together of thesis and anti-thesis, relation (Peirce Second)

Hyper Identity[3] Synthesis (effectiveness, efficiency) goes beyond but brings along cf. Hegel, continuity (Peirce Third)

Wild Identity[4] Synergy (Fuller Fourth)

Ultra Identity[5] non-dual connection

Similar differentiation could be made in the other aspect of being. Deleuze inverts the image of representation[12] and appeals to mass repetition over set representation as its opposite as well as appealing to the meta-levels of difference rather than identity which we can see in the Peirce/Fuller categories. But if we extend his proposed exploration to the next level, i.e. into Ultra Being we see there non-duality and the non-nihilistic distinction that intimates the nature of ipsity of conjuncted conglomerates that we seen in the nature of the monad as faceted jewels in the net of interpenetration. In this level the

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[10] Deleuze, G. Difference and Repetition, page 119
[11] Deleuze, G. Difference and Repetition, page 144
[12] Deleuze, G. Difference and Repetition, page 167

faculties are faceted jewels that reflect each other. In Arabic the word for essence is Jawhar, which means jewel. In effect the essences of things, as indicators of the sources, are seen as jewels, faceted monads that hold together the various characteristics and attributes of things but are never themselves seen and appear only as sets of constraints on those attributes and characteristics.

Our New Monadology is one that appeals to the non-dual and the non-nihilistic distinctions that appear in existence of void or emptiness. The monads are articulations of the void or emptiness in the bedrock of existence. They express the sources beyond the void or emptiness. They articulate ourselves as well as the things we perceive, remember, imagine and cogitate on. The differences of the letters is merely an indicator of the differentiation of our own faculties, i.e. as fragments of opacity of our unconscious.

We see this opacity of difference-in-itself in the differentiation of the Egyptian Ntr or the Greek gods or the Sumerian Gods, but also in the differences in the qualities of the atomic elements. There is no explanation why atoms have the qualities they have and how those qualities change when the atoms are combined in molecules. A similar sort of difference-in-itself, i.e. wild opacity appears at each emergent level of the ontic series of the emergent hierarchy of the physus. The same is true of all four emergent hierarchies, i.e. the ontological, the social and the individual hierarchies. At each level there is a wild opacity or difference in itself that we are confronted with. For each of these differentiations there is in us an observer, a perceiver, and imaginer, a cogitator and agent which can comprehend the difference-in-itself. To that extent all the emergent levels of the four hierarchies are mirrored in us as observers and thus differentiate us internally and unconsciously in some sense.

The New Monadology seeks to understand the nihilistic distinctions and the non-duals that appear in existence beyond this wild opacity in Ultra Being. This of course is a tall order. One which cannot be satisfied easily or immediately. However, understanding the ramifications of that possibility of a New Monadology is a first step on the Way.

Appendix: Monadology: A commentary

"Monadology"*

(translated by Robert Latta; revised by Donald Rutherford)[13]

1. The monad, of which we shall speak here is nothing but a simple substance that enters into composites; simple, that is, without parts. (sec. 10)

In our case the monad may not be a substance and it has quasi-parts called facets. Substance is something that has Being. So to the extent that the monad is projected as Being then it may be considered a substance. In papers written by Ben Goertzel but jointly authored this is called an 'ON.' But we reserve the right not to project the monad and to merely recognize its existence. In that case it does not have Being but merely exists. Also in that case the monad is considered non-dual and empty or void. As such it neither has parts nor lacks them, this non-dual state is called having facets. Facets are like the faces of a faceted jewel, They are different yet are not completely different so that the monad retains its unity, while at the same time embracing a plurality of facets which form a totality of facets.

2. And there must be simple substances, since there are composites; for a composite is nothing but a collection, or aggregate, of simples.

Physics has found that there are atoms, particles and quarks, but they are not simple. Thus, it seems that simplicity is a unobtainable goal in the conceptual arena of the external scientific monadology. With regard to perceptual content, i.e. the qualia, we can never see the qualia by itself, we only see it within the context of pattern. So the perceptual qualia content in isolation is also an ideal that is unobtainable. So simplicity is not obtainable,

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http://philosophy2.ucsd.edu/~rutherford/Leibniz/monad.htm

there is only complexity all the way down, both conceptually and perceptually.

3. But where there are no parts, there is neither extension nor figure, nor any possible division. These monads are the true atoms of nature and, in a word, the elements of things.

What seems to happen as we go down we find the level of quarks where the quarks themselves never appear alone. Similarly perceptual content never appears alone but only in patterns. This never appearing alone is the barrier that makes the monad-facet pair the horizon of the small, at what ever level it is ontologically projected. As science proceeds it is projected at lower and lower levels. But the nature of the monadic frontier never changes because it is always the case that the monads only appear together in swarms and never in isolation. And they are also neither with nor without parts but actually some non-dual state between these two possible states.

4. No dissolution of these elements need be feared, and there is no conceivable way in which a simple substance can perish naturally. (sec. 89)

This is as we know not true from a scientific point of view. Seems like every posited level has some lower level of differentiation. However, it is also true because of conservation of matter and energy that although dissolution happens the energy packed in these monads never vanishes. From a perceptual point of view qualia is always replaced endlessly by other qualia which always has its own specific Chi, or subtle energy configuration.

5. For the same reason there is no conceivable way in which a simple substance can begin naturally, since it cannot be formed through composition.

We posit that monads pop into existence and then out of existence. They arise ex nihilio from the void from the point of view of their being external or from emptiness in terms of being internal, i.e. as qualia of consciousness. Thus we take exactly the opposite view from that of Democritus who wanted to say monads are eternal. We say instead that they are created and destroyed arising from void or emptiness and disappearing into it again. We see monads as emphermal. Close your eyes and look at the patterns of colors that dance before you in your imagination. That patterning is made up of monads, ideals entities of pure content, i.e. qualia. It arises and is destroyed instantaneously as the pattern eternally changes.

6. Thus it may be said that monads can only begin or end all at once; that is, they can only begin by creation and end by annihilation, whereas that which is composite begins or ends through its parts.

This unnatural beginning and ending is precisely what we posit for monads. They are the "substance"

of the fire of Heraclitus, or his ever changing river that you cannot step into twice.

7. Further, there is no way of explaining how a monad can be altered or changed internally by any other created thing; for it is impossible to change the place of anything in it or to conceive in it any internal motion that could be excited, directed, increased or diminished therein, although all this is possible in the case of composites, in which there are changes among the parts. Monads have no windows, through which anything could enter or leave. Accidents cannot be separated from substances or go about outside of them, as the sensible species of the Scholastics used to do. Thus neither substance nor accident can enter a monad from without.

Thus monads have an autopoietic nature. Which is to say that they are closed as an organization of structural facets. What becomes clear is that the special systems organize monads. Facets are dissipative ordering and it is the conjunction of dissipative facets that make an autopoietic and symbiotic monad, which then only appears in reflexive social swarms. The key difference with the monad is that the facets cannot be separated from each other, and the monads never appear alone. At the limits of perception and conception of the small we see the special systems as the key structuring principle in the relation of pattern-monad-facet as emergent levels of organization.

8. Yet monads must have some qualities, otherwise they would not even be beings. And if simple substances did not differ in their qualities, there would be no means of perceiving any change in things; for what is in the composite can come only from its simple ingredients; and monads, if they had no qualities, would be indistinguishable from one another, since they do not differ in quantity. Consequently, assuming a plenum, in motion each place would always receive exactly the equivalent of what it already had, and one state of things would be indistinguishable from another.

Monads exhibit qualia, but not quantity, and the quality lasts for some quantized time. This is in effect the Ashari atomic theory developed by the Muslims as a way to coordinate Aristotelianism and Islamic Theology. Qualia is what appears in space and Quantification occurs only in time. The qualia is the states of affairs that the observer produces for other observers to preceive in active time.

9. Indeed, each monad must be different from every other; for in nature there are never two beings which are perfectly alike and in which it is not possible to find an internal difference or one founded on an intrinsic denomination.

Each monad is unique in terms of its qualia presentation. But we categorize them into color and other sorts of categories. But the qualia never quite fit the categorizations that are projected on them.

10. I assume also as a given that every created

being, and consequently the created monad as well, is subject to change, and further that this change is continual in each.

Leibniz here is in line with Heraclitus and we accept that position as well. But complete and utter change is also nihilistic. Thus we must introduce a mixture of stasis and change as well as partial categorizability. In other words the monad is non-dual between change and stasis, it is non-dual between categorizability and non-categorizibility at the level of existence, i.e. outside Being. There is some position that is neither that of Parmenides nor Heraclitus that is true of the monads. But Heraclitus is closer than Parmenides because he does not assume Being as Parmenides does.

11. It follows from what has just been said, that the natural changes of monads come from an internal principle, since an external cause cannot influence it internally. (secs. 396, 400)

Monads are like the virtual particles that are thought to make up spacetime. They are created and destroyed in a certain limit of time, i.e. below the threshold of Planck's constant, and they interact with other particles in that time in ways that may create side effects. These side-effects may form cascades and those cascades can form loops, and sets of these loops have previously been called 'annihilation mosaics' which persist over time as the monads vanish. The world as we know it is made up of these annihilation mosaics. They are persisting in the face of massive annihilation due to the loops that allow them an <u>eternal return</u>. *The nature of existence as void or emptiness is precisely this persistence in the face of annihilation (physus), cancellation (mathesis) or contradiction (logos). It is based on creation and destruction at the monadic level, i.e. the level of virtual particles, which leads to persistence through annihilation mosaics, which are looping cascades of side effects.*

12. But, besides the principle of change, there must be a diversity in that which changes, which produces, so to speak, the specification and variety of simple substances.

Variety is a product of the Good, a non-representable intelligible. Variety is unbounded, i.e. there is no structural model that will encompass and explain the production of variety by humans. Change is not only creation and destruction of monads but the production of variety in monads as qualia themselves.

13. This diversity must involve a multitude in the unity or in the simple. For all natural change occurs gradually, something changes and something remains; consequently, there must be a plurality of affections and relations in a simple substance, although it has no parts.

This is like the idea of the facet. Leibniz calls the facets affections. Monads are unities, autopoietic unities. But this unity is produced by conjunction that causes the two reals to become a complex number by symmetry breaking. Complex numbers

are a conjunction of real and imaginary numbers. It is not a normal kind of unity. This is the mistake of Maturana and Varella in their original formulation of autopoietic special systems. They saw them as unities of organization that lords over changes at a structural level where plurality exists that is gathered into a totality by the boundary of the autopoietic special system. Instead, we see that plurality produces in one direction unity and another direction totality and the non-dual between these is wholeness, which is not specified in Kant's dialectical description of the whole part categories. Wholeness as a system is either less than or greater than or the non-dual equal to the sum of its parts. And if it is equal to the sum of its parts then it is either reflexive, dissipative or the non-dual autopoietic. Thus we move by steps into a non-dual way of looking at monads as wholes, not just combinations of unity, totality, and plurality.

14. The passing state that involves and represents a multitude in the unity, or in the simple substance, is nothing but what is called perception, which is to be distinguished from apperception or consciousness, as will become clear later. The Cartesians have seriously erred in this, for they discount entirely perceptions of which we are not aware. This has led them to believe also that minds alone are monads, and that there are no souls of beasts or other entelechies. Thus, like common people, they have failed to distinguish a prolonged unconsciousness and actual death, which has made them fall back into the Scholastic prejudice of entirely separate souls, and has even confirmed unbalanced minds in the opinion that souls are mortal.

Here Leibniz attacks the dualism of the Cartesians. We support that attack but recognize that the non-dual and the dual are two sides of the same coin. Without the Cartesians you could not have Leibniz attempting to solve the problem they invented. Notice Leibniz appeals to the unconscious here. Descartes did not play enough attention to his dreams.

15. The action of the internal principle that produces the change or passage from one perception to another may be called appetition. It is true that appetite cannot always fully reach the entire perception at which it aims, but it always obtains some of it and reaches new perceptions.

Here Leibniz considers the desires or the appetites to be the driving force within the monads. Thus in Deleuze's terms we are dealing with desiring machines or virtual nodes in a series. From the point of view of Nietzsche and the romantics these are the passions or Trieb.

16. We ourselves experience a multitude in a simple substance, when we find that the least thought of which we are aware involves a variety in its object. Thus all those who admit that the soul is a simple substance should admit this multitude in the monad; and M. Bayle ought not to find any difficulty in it, as he has done in his Dictionary, article 'Rorarius.'

Variety is necessary for us. What is good for one person is not good for another. The variety of nature reflects needs for variety in us.

17. Moreover, it must be confessed that perception and that which depends on it are inexplicable in mechanical terms, that is, in terms of figures and motions. And supposing there were a machine, so constructed as to think, feel, and have perception, one could imagine it increased in size, while keeping the same proportions, so that one could go into it as into a mill. In that case, we should, on examining its interior, find only parts that work upon one another, and never anything by which to explain a perception. Thus, perception must be sought in a simple substance, and not in a composite or machine. Further, nothing but this (namely, perceptions and their changes) can be found in a simple substance. It is in this alone also that all the internal actions of simple substances can consist.

Perception is a result of the whole. This is the problem with Observer Theory. Observer Theory attempts to make perception into a mechanism of separate parts but perception always works with the whole and that is why we have gestalts where part is seen in relation to background and wholeness only occurs by multiple perceptions in a proto-gestalt. This critique of mechanization is a key point that we need to apply to observer theory that posits the different aspects of the observer but does not tell us how they are brought together and their differences sustained. However, in all the schemas there is this non-dual wholeness which is exemplified.

18. All simple substances, or created monads, can be called entelechies, for they have in them a certain perfection (echousi to enteles); they have a self-sufficiency (autarkeia) which makes them the sources of their internal actions and, so to speak, incorporeal automata. (sec. 87)

We prefer the idea of Jacques Monod of Teleonomy to Teleology. In other words the idea that they have a teleology, or perfection, or self-sufficiency are all idealizations. But they are instead autopoietic, i.e. have their own reasons which are hidden from us and themselves and thus are unconscious. This is to say that the drive is toward something, not necessarily determined in advance, but determined on the way.

19. If we wish to give the name "soul" to everything that has perceptions and appetites in the general sense I have just explained, then all simple substances or created monads could be called souls; but as sensation is something more than simple perception, I believe the general name "monad" or "entelechy" suffices for simple substances that have perception only, and that the name "soul" should be given only to those in which perception is more distinct and accompanied by memory.

Observers do not necessarily have memory. What has memory is more like a Turing machine. Leibniz seems to be making a similar distinction here except he is not talking about a machine but something that has wholeness like the five Hsing (transformations)

in Chinese traditional science.

20. For we experience in ourselves a state in which we remember nothing and have no distinguishable perceptions, as when we fall into a faint or when we are overcome with a profound dreamless sleep. In this state the soul does not differ perceptibly from a simple monad; but as this state is not lasting, and the soul recovers from it, the soul is something more than a simple monad. (sec. 64)

The soul is more like something that is reflexive than a monad which is autopoietic. This was Plato's point when he directed us to look at the city to discover the nature of the soul, and Nietzsche's point when he pointed to the multiplicity of passions and perspectives that we are made up of psychologically.

21. And it does not follow from this that the simple substance is without any perception. That, indeed, cannot be, for the reasons already given; for it cannot perish, and it also cannot continue to exist without some affection, which is nothing but its perception. But when there is a great multitude of little perceptions in which nothing is distinguished, we are dazed, just as when we turn continuously round in the same direction several times in a row, and there follows from this a giddiness that can make us faint and prevents us from distinguishing anything. Death may for a time put animals into this state.

Here Leibniz approaches the problem of nihilism. All the variety cannot be a pure plenum but there needs to be distinctions made on the basis of relevance, significance or meaning, and ultimately there need to be anchoring non-nihilistic distinctions or the whole set of differences distinguished with collapse. Nihilism is the fundamental problem in the Western Tradition. How to make a non-nihilistic distinction seems to be a mystery in our tradition. It only becomes clear in traditions that understand non-duality. The non-dual is the image of identity in existence beyond Being. The non-nihilistic distinction is the image of difference in existence beyond Being. Non-duality and Non-nihilistic distinctions are complementary. Dizziness is the succumbing to nihilism. How monads produce in perception non-nihilistic distinctions because of their rootedness in the non-dual at the level of existence is what needs to be understood.

22. And as every present state of a simple substance is naturally a consequence of its preceding state, so its present is pregnant with its future. (sec. 350)

The relation of past, present and future to the monad brings us to the question of emergence. Emergence is what drives nihilism forward by the intensification of nihilism. Emergence as G.H. Mead understood it was something utterly new and unheard of and unforeseen that rewrites history and opens up new future possibilities as well as producing a radical difference that makes a difference in the present. Monads are embedded in the various kinds of Being which organize the appearance and disappearance of virtual particles, and it is the kinds of Being that

the emergent event must embody in order to be genuinely emergent, i.e. world transforming.

23. Therefore, since on waking from a stupor, we are aware of our perceptions, we must have had perceptions immediately beforehand, although we were not aware of them; for one perception can only come naturally from another perception, as one motion can only come naturally from another motion. (secs. 401-403)

The fact that there are unconscious proto-perceptions has been confirmed by science. We note the possibility of subliminal advertising for example. The existence of the unconscious is fairly well taken for granted at this point. But like the nature of quantum phenomena on the microscale we cannot be said to understand it yet.

24. From this we see that if we had nothing distinguished in our perceptions—nothing, so to speak, heightened and of a more eminent character, we would always be in a stupor. And this is the state of bare monads.

Thus there is a distinction between unconscious awareness and consciousness which is intentional. What is normally left out is the intermediate state of awareness as such which is diffuse and amorphous and trance-like. Studies that show that there is little difference between sleeping and waking show us that we spend most of our time in this intermediate state.

25. Furthermore, we see that nature has given heightened perceptions to animals, by the care she has taken to provide them with organs, which collect numerous rays of light or numerous undulations of the air, in order to make them have a greater effect through their union. Something similar to this takes place in smell, in taste and in touch, and perhaps in a number of other senses, which are unknown to us. And I will explain presently how that which takes place in the soul represents what happens in the organs.

The higher fineness of the senses of animals has been established. But what is only recently been seen is that they also experience time differently than we do. Different animals experience time at different rates even though lifespans in terms of breaths and heartbeats are about the same length. Only Human lifespans are about one third longer than all other animals.

26. Memory provides souls with a kind of succession, which imitates reason, but which must be distinguished from it. Thus we see that when animals have a perception of something which strikes them and of which they have formerly had a similar perception, they are led by the representation in their memory to expect what was combined with the thing in this previous perception, and they come to have feelings similar to those they had on the previous occasion. For instance, when a stick is shown to dogs, they remember the pain it has caused them, and howl and run away. (Prelim. Disc., sec. 65)

Memory plays a key role that is not recognized in observer theory but is recognized in the Turing Machine recognizers. Memory is something that should be added to observer theory. The question is what is non-dual between perception and memory, and that is imagination. That is why we say the monad is complex and has an imaginary as well as a real component. Both memory and perception are real. One is internal stimulus and the other is external stimulus. The imagination is the basis of projection, or the elicited response. But imagination like the will can act independently.

27. And the strength of the imagination that impresses and moves them comes either from the magnitude or multitude of the preceding perceptions. For often a strong impression produces all at once the same effect as a long-formed habit, or as many often-repeated ordinary perceptions.

Habit is behavioral memory. We need to recognize that memory is not just cognitive but also behavioral as well. What is interesting is the existence of a pure past, which has never existed in which myths are imagined. Sometimes like false memories these imaginations seem more real than either real memories or perceptions.

28. Men act like beasts insofar as the succession of their perceptions is due to the principle of memory alone; they resemble empirical physicians, who have a simple practice without theory. Indeed, in three-quarters of our actions we are nothing but empirics. For instance, when we expect that the sun will rise tomorrow, we act like an empiric, for it has always happened this way in the past. It is only the astronomer who judges this on the basis of reason. (Prelim. Disc., sec. 65)

Leibniz introduces the divided line between reason and opinion. Plato in the divided line distinguished between mere appearance and opinion on the one hand and faith on the other. He also distinguished between representable and non-representable intelligibles. The empric is what Plato called faith, i.e. well founded opinion based on experience.

29. But it is the knowledge of necessary and eternal truths that distinguishes us from mere animals and gives us reason and the sciences, raising us to the knowledge of ourselves and of God. And it is this in us that is called the rational soul or mind.

Non-representable intelligibles include what Plato calls the Good and Fate among the non-duals. Representable intelligibles are like Order and Right among the non-duals.

30. It is also through the knowledge of necessary truths and their abstractions that we rise to reflective acts, which make us think of what is called I, and consider that this or that is within us: and thus, thinking of ourselves, we think of being, of substance, of the simple and the composite, of the immaterial, and of God himself, conceiving that what is limited in us is in God without limits. And these reflective acts furnish the chief objects of our reasonings. (Pref. [GP VI 27])

Reflective acts are those that that take place in a reflexive social milieu. They are acts that are self-conscious. From the reflexive milieu the monad which is autopoietic comes to know itself as a unity, i.e. as the ego. But the totality of the self is a Jung says more than the ego, it includes all the things that the ego would deny of itself. Notice Leibniz brings to bear the fundamental distinction between finite and infinite. He associates God with the infinite. God has been known as the 'Supreme Being' in the Western Tradition. It can be thought of as Man's inverted image of himself projected onto the absolute. Because these acts are thoughts they are concentrated in Logos rather than in Physus.

31. Our reasonings are founded on two great principles: that of contradiction, in virtue of which we judge that which involves a contradiction false, and that which is opposed or contradictory to the false true. (secs. 44, 169)

This is another fundamental presupposition of the Western Tradition, Non-contradiction or Excluded Middle that comes from Aristotle. It is precisely this assumption that hides the possibility of the non-dual. Other traditions do not make this extreme assumption, for instance the Buddhist tradition has the Tetralemma (A, ~A, Both A and ~A, Neither A nor ~A). Aristotle explicitly denies the tetralemma. He thinks that it means that all the statements are made at the same time. He does not realize that the one holding the tetralemma would make the statements at different times depending on what is being said but over time all the tetralemma statements would be made. Buddhist discourse ultimately amounts to silence, but is not necessarily saying these statements all at once, but only as the need arises in the dialogue. We argue that Aristotles principle of non-contradiction and excluded middle is not necessary. Skillful means can say things that are meaningful which however in the end amount to silence. Aristotle has no real appreciation of silence as the ground for all speech and the fact that there are many sorts of silence. The silence of the wise and the fool are not the same. There is a non-nihilistic distinction between them. There are paraconsistent and para-complete logics as Priestly argues.

32. And that of sufficient reason, in virtue of which we hold that there can be no real or existing fact, no true statement, unless there is a sufficient reason, why it should be so and not otherwise, although these reasons usually cannot be known by us. (secs. 44, 196)

Reason is the offering of excuses. It says that everything must have a ground. But we have discovered since Nietzsche that there is only groundlessness. All attempts to find grounds have failed. There is only void or emptiness which exists as an ungrounded ground which we call the bedrock of existence. Groundlessness is the bedrock.

33. There are two kinds of truths, those of reason and those of fact. Truths of reason are necessary and their opposite is impossible; truths of fact are contingent and their opposite is possible. When a truth is

necessary, its reason can be found by analysis, resolving it into simpler ideas and truths, until we come to those that are primitive. (secs. 170, 174, 189, 280-282,367; Summary, Obj. 3)

Leibniz here defines reason separating theory from fact. However, we now know since Kant that understanding comes from a mixture of reason and experience. Reason by itself runs into the antinomies. Leibniz philosophy is called by Kant dogmatic because it is not yet critical of reason recognizing its limits.

34. It is in this way that the speculative theorems and practical canons of the mathematicians are reduced by analysis to definitions, axioms and postulates.

Mathematics is taken as the prime example of reasoning by reduction. Descartes established Skepticism and Reductionism as the two great principles of Science. Spinoza attempts to emulate this method in his Ethics. But now we know that the mathematical program of axiomization of everything does not work. Godel showed us that this model for reasoning is flawed. Rather we define reason as the use of all the aspects of Being together to attempt to provide a ground. But that the limits of reason is that this ground is in actuality impossible to provide completely, so we must become anti-foundationalists at heart while we still provide reasons in pracitice.

35. Finally, there are simple ideas, which cannot be defined; there are also axioms and postulates, or in a word, primitive principles, which cannot be proved and indeed have no need of proof; these are identical propositions, whose opposite involves an explicit contradiction. (secs. 36, 37, 44, 45, 49, 52, 121-122, 337, 340-344)

Husserl discovered that essences are not simple ideas. This is what led to the uncovering of the different kinds of Being. Mathematics is a bad model for conceptualization in general.

36. But there must also be a sufficient reason in contingent truths or truths of fact, that is, in the succession of things dispersed throughout the universe of created beings; here analysis into particular reasons could proceed into unending detail, because of the immense variety of things in nature and the infinite division of bodies. There is an infinity of present and past shapes and motions that enter into the efficient cause of my present writing, and there is an infinity of past and present minute tendencies and dispositions of my soul that enter into its final cause.

Leibniz here talks about the limits of reason from the point of view of endless grounding of everything. He says we must settle for sufficient reason and not ask for endless reasons because we are finite beings.

37. And as all this detail involves other prior or more detailed contingent things, each of which again needs a similar analysis to give its reason, we are no further ahead: and the sufficient or final reason must be outside of the succession or series of this diversity of contingent things, however infinite it may be.

Reason in Leibniz view takes us outside of time and space.

38. Thus the final reason of things must be in a necessary substance, in which the diversity of changes exists only eminently, as in its source; and this substance we call God. (sec. 7)

God the Supreme Being knows the final cause of everything. God is the inverse image of Man projected on the absolute.

39. Now as this substance is a sufficient reason for all this diversity, which also is everywhere connected, there is only one God, and this God is sufficient.

The sufficiency of the final cause leads to the idea of the oneness of God. The absolute is by definition unique. There cannot be many absolutes. There is one metaphysical principle that Anaximander called apeiron *and Parmenides suggested should be identified with Being.*

40. We may also conclude that this supreme substance, which is unique, universal and necessary, nothing outside of it being independent of it, and which is a mere consequence of possible being, must be incapable of limits and must contain as much reality as possible.

This characterization of the absolute is classic. Leibniz was a precursor to Hegel who recognized that there was an absolute reason which was God in the details. So to for Leibniz God is the ground of the monads.

41. From this it follows that God is absolutely perfect; for perfection is nothing but the magnitude of positive reality, in the strict sense, leaving aside the limits or bounds in things that have them. And where there are no bounds, that is, in God, perfection is absolutely infinite. (sec. 22; Pref. [GP V 27])

The absolute is also seen as perfect. What ever man is God is the opposite. This makes God a projection by inversion of the image of Man.

42. It follows also that created beings derive their perfections from the influence of God, but that their imperfections come from their own nature, which is incapable of being without limits. For it is in this that they differ from God. (secs. 20, 27-30, 153, 167, 377 sqq.; secs 30, 380; Summary, Obj. 5)

Perfection and Imperfection, Infinite and Finite, Unique and manifold. There are innumerable opposites to ascribe to Man and God. Thus the metaphysical is defined in relation to logos and physus. But as Heidegger says, in the metaphysical era the gods are fleeing.

43. It is further true that in God there is not only the source of existences but also that of essences, insofar as they are real, that is, the source of what is real in the possible. For the understanding of God is the region of eternal truths or of the ideas on which they depend, and without him there would be nothing real in possibilities, and not only would there be nothing existing but nothing would even be possible. (sec. 20)

The mind of God contains the essences not just the existences that are his body. Actual and possible, Real and illusory are other dualities that come into play in the definition of God. But existentialism gives the existences priority over the essences, as does Leibniz here in his argument. Reality, Truth, Identity, and Presence are the aspects of Being.

44. For if there is a reality in essences or possibilities, or rather in eternal truths, this reality must be founded in something existing and actual, and consequently in the existence of the necessary being, in which essence involves existence, or in which to be possible is to be actual. (secs. 184-189, 335)

This is an argument put forward by the Muslims that God was the necessary existent. Notice that there is a loop created as essence entails existence and the possible entails the actual. This vicious circle where essences turn into existence which as actualities turn into possibilities that in turn give rise to essences. This gives dynamism to the nature of God.

45. Thus God alone (or the necessary being) has this privilege, that he must exist, if he is possible. And as nothing can interfere with the possibility of that which involves no limits, no negation and consequently no contradiction, this alone suffices to make known the existence of God a priori. We have thus proved God's existence through the reality of eternal truths. But we have just proved it also a posteriori, since there exist contingent beings, which can have their final or sufficient reason only in the necessary being, which has the reason for its existence in itself.

This proof of God is of course the whole point of the exercise. Hegel instead talks about spirit that moves through history. God makes the world a system by giving it a unity in totality of plurality. It does not take into account the General Economy that Plotnitsky talks about in In the Shadow of Hegel. What about the god of the general economy beyond the restricted economy?

46. We must not, however, imagine, as some do, that eternal truths, being dependent on God, are arbitrary and depend on his will, as Descartes and later M. Poiret, appear to have held. That is true only of contingent truths, of which the principle is fitness or the choice of the best, whereas necessary truths depend solely on his understanding and are its internal object. (secs. 180-184, 185, 335, 351, 380)

Necessary truth goes along with the necessary existence and the reality of God. Actuality and

Possibility is a way to talk about presence. Oneness of God is a way to talk about Identity. Basically all the aspects of Being are displayed in God.

47. Thus God alone is the primitive unity or original simple substance, of which all created or derivative monads are products; and they are born, so to speak, through continual fulgurations[14] of the divinity from moment to moment, limited by the receptivity of the created thing, of whose essence it is to be limited. (secs. 382-391, 398, 395)

Fulgurations are lightenings. Monads appear as present from as lightenings from God. This is an interesting metaphor which reminds us of the scintillations talked about by Jung in Mysterium Conjunctus.

48. In God there is power, which is the source of all, then knowledge, which contains the diversity of ideas, and finally will, which brings about changes or products in accordance with the principle of the best. (secs. 7, 149, 150) And these characteristics correspond to what in created monads makes up the subject or ground, the faculty of perception, and the faculty of appetition. But in God these attributes are absolutely infinite or perfect, and in created monads or entelechies (or perfectihabies, as Hermolaus Barbarus translated the word) there are only imitations of these attributes, according to the degree of perfection. (sec. 87)

This is how God is a projection of Man as subject (power) with perception (knowledge) and desire (will).

49. A created thing is said to act outwardly insofar as it has perfection, and to be acted upon by another, insofar as it is imperfect. Thus action is attributed to the monad, insofar as it has distinct perceptions, and passion insofar as its perceptions are confused. (secs. 32, 66, 386)

Action is brought about by imperfection.

50. And one created thing is more perfect than another in that there is found within it that which serves to explain a priori what happens in the other, and it is for this reason that the former is said to act upon the latter.

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[14] One entry found for fulguration.

Main Entry: ful·gu·ra·tion

Pronunciation: "ful-g(y)&-'rA-sh&n, "ful-j&-, f&l-

Function: noun

Etymology: Latin fulguration-, fulguratio sheet lightning, from fulgurare to flash with lightning, from fulgur lightning, from fulgEre

Date: 1633

1 : the act or process of flashing like lightning

2 : ELECTRODESICCATION

- ful·gu·rate <http://www.m-w.com/images/audio.gif>

/'ful-g(y)&-"rAt, 'ful-j&-, 'f&l-/ transitive verb

By greater intensity of perfection one being acts on another being.

51. But in simple substances the influence of one monad upon another is only ideal, and it can have its effect only through the mediation of God, insofar as in the ideas of God any monad reasonably claims that God, in regulating the others from the beginning of things, should have regard for it. For since one created monad cannot have any physical influence upon the interior of another, it is only by this means that the one can be dependent upon the other. (secs. 9, 54, 65, 66, 201; Summary, Obj. 3)

Here is the secret connection between monads through god. In Kant this becomes the secret connection between transcendental subject and transcendental object though the transcendental relation of God. God knows the noumena and makes subjective and objective experience cohere.

52. Accordingly, among created things, actions and passions are mutual. For God, comparing two simple substances, finds in each reasons that oblige him to accommodate the other to it, and consequently what is active in certain respects is passive from another point of view; active insofar as what is known distinctly in it serves to explain what happens in another, and passive insofar as the reason for what takes place in it is found in what is distinctly known in another. (sec. 66)

God creates complementarity in the world.

53. Now, as there is an infinity of possible universes in the Ideas of God, and as only one of them can exist, there must be a sufficient reason for God's choice, which determines him toward one rather than another. (secs. 8, 10, 44, 173, 196 sqq., 225, 414-416)

This is an assumption that only one of the many possible worlds exist. The idea of the Pluriverse is that they all exist simultaneously and their interference gives us quantum mechanical phenomena on the microscale. I argue elsewhere that the universe is quantum mechanical top to bottom and the fact we do not see it comes from our projection of Being onto the world. In existence everything is quantum mechanical.

54. And this reason can be found only in the fitness, or the degrees of perfection, that these worlds contain, since each possible thing has the right to claim existence in proportion to the perfection it involves. (secs. 74, 167, 350, 201, 130, 352, 345 sqq., 354)

This is the best of all possible worlds. Enter Voltaire.

55. And this is the cause of the existence of the best, which God knows through his wisdom, chooses through his goodness, and produces through his power. (secs. 8, 78, 80, 84, 119, 204, 206, 208; Summary, Objs. 1, 8)

God is good. The Christian idea as Jung shows is that evil is privative. Thus evil is not really anything, a mere negative condition. But this produces an unconscious imbalance that needs to be righted by the acceptance of evil into the nature of God.

56. Now this connection or accommodation of all created things to each and of each to all the others, means that each simple substance has relations that express all the others, and, consequently, that it is a perpetual living mirror of the universe. (sec. 130, 360.)

Here is an excellent metaphor for interpenetration. We agree with Leibniz that the monads interpenetrate but without the ground of God.

57. And just as the same town looked at from different sides appears completely different, and as if multiplied in perspective, so through the infinite multitude of simple substances, it is as if there were so many different universes, which nevertheless are only perspectives on a single universe, according to the different point of view of each monad. (sec. 147)

*
Here perspective comes into play. Monads are created from seeds in God, and then they attain different perspectives by which the universe appears as a pluriverse. Monads schematize through their passion and perception. They produce myriad possible universes, but these annihilate into the best of all possible worlds. AHA Leibniz has an idea similar to the Emergent Meta-system.

58. And by this means there is obtained as much variety as possible, along with the greatest possible order; that is, it is the means of obtaining as much perfection as possible. (secs. 120, 124, 241 sqq., 214, 243, 275)

Notice how the EMS structure gives rise to ultra-efficient or ultra-effective properties.

59. Besides, only this hypothesis (which I venture to call demonstrated) suitably exalts the greatness of God; and this Monsieur Bayle recognized when, in his Dictionary (article 'Rorarius'), he raised objections to it, in which he was inclined even to think that I was attributing too much to God—more than it is possible to attribute. But he was unable to explain why this universal harmony, according to which every substance exactly expresses every other through the relations it has with them, was impossible.

Notice that the functioning of the Emergent Meta-system produces universal harmony.

60. Further, one sees in what I have just said the a priori reasons why things could not be otherwise than they are. For God in regulating the whole has had regard for each part, and in particular for each monad, whose nature being representative, nothing can limit it to representing only a part of things, although it is true that this representation is only confused as regards the detail of the entire universe, and can be distinct only as regards a small part of things, namely, those that are either nearest or greatest in relation to each of the monads; otherwise each monad would be a divinity. It is not in their object, but in the mode of their knowledge of the object,

that monads are limited. They all move confusedly toward the infinite, the whole; but they are limited and distinguished through the degrees of their distinct perceptions.

This is the argument for why the monads schematize. In other words all the other schemas up to the universe and pluriverse pour out of the monad-facet. From the small we move all the way to the large and their is a harmony in that movement which is the wholeness of the hierarchy of schemas. And like Leibniz we now think that this comes from the operation of the Emergent Meta-system between the four hierarchies, rather than out of the ground of the reversed image f Man in God.

61. And composites agree in this respect with simple substances. For all is a plenum (and thus all matter is connected) and in the plenum every motion has some effect upon distant bodies in proportion to their distance, so that each body not only is affected by those which are in contact with it and in some way feels the effect of everything that happens to them, but also is indirectly affected by bodies touching those with which it is in immediate contact. It follows that this communication extends to any distance, however great. And consequently every body feels the effect of all that takes place in the universe, so that one who sees all could read in each what is happening everywhere, and even what has happened or will happen, observing in the present that which is far off in time as well as in place: sympnoia panta, as Hippocrates said. But a soul can read in itself only what is represented there distinctly; it cannot unpack all at once all its implications, for they extend to infinity.

Proof by experiment of Bells theorem has shown that there is action at a distance connections between things that have once been together within the universe no matter how far a part they get. Not only is there interpenetration but mutual effect within the whole of the universe between all of its parts.

62. Thus, although each created monad represents the whole universe, it represents more distinctly the body which is specially assigned to it, and of which it is the entelechy; and as this body expresses the whole universe through the connection of all matter in the plenum, the soul also represents the whole universe by representing this body, which belongs to it in a particular way. (sec. 400)

There is a representational (count) relation between whole and monad. There is a repetitional (mass) relation between the monads themselves. In effect communication of effects by touching other monad instances is a mass like embodiment.

63. The body belonging to a monad, which is its entelechy or soul, constitutes with the entelechy what can be called a living thing, and with the soul what is called an animal. Now this body of a living thing, or animal, is always organic; for as every monad is, in its own way, a mirror of the universe, and as the universe is regulated according to a perfect order, there must also be an order in that which represents it, i.e., in the perceptions of the soul, and consequently in the body, according to

which the universe is represented in the soul. (sec. 403)

The universe is a big organism and the monad is an animal organism. Both monad and universe are autopoietic. They reflect each other's autopoietic quality. This reflection is reflexive. Each has a negentropic ordering which is dissipative. In other words we can read into Leibniz words the idea that the special systems govern the schemas. He as picked universe and monad as opposite schemas just as we do when we call the universe a kosmos.

64. Thus the organic body of each living thing is a kind of divine machine or natural automaton, which infinitely surpasses all artificial automata. For a machine made by human art is not a machine in each of its parts. For instance, the tooth of a brass wheel has parts or fragments which for us are no longer artificial things, and which have nothing to indicate the machine in relation to which the wheel was intended to be used. But machines of nature, that is, living bodies, are still machines in their smallest parts, to infinity. It is this which constitutes the difference between nature and art, that is, between divine art and ours. (secs. 134, 146, 194, 403)

Leibniz differentiates divine machines or natural automates from artificial machines, as Maturana and Varella would differentiate allopoietic from autopoietic machines. Leibniz says that natural machines are machines on infinitely smaller scales whereas artificial machines have some lower bound where their machine like quality vanishes. The point is that these autopoietic machines are negentropic, i.e. based on what Pirgogine calls dissipative (ordering) structures. We now talk about order from nowhere as Kauffman does rather than infinitely deep automates. We don't believe that they are machines on the atomic, particle, quark or string levels. We just think they are special kinds of machines that self-produce themselves.

65. And the Author of nature has been able to practice this divine and infinitely marvelous art, because each portion of matter is not only infinitely divisible, as the ancients recognized, but also actually subdivided without end, each part into parts, of which each has some motion of its own; otherwise it would be impossible for each portion of matter to express the whole universe. (Prelim. Disc., sec. 70; sec. 195.)

It turns out that we can think Leibniz was right about the seemingly infinite depth of creation, but not that they are machines all the way down. Instead we think about emergent ontic levels like string, quark, particle, atom, molecule, cell, organism, social group. Each level is emergent with respect to the lower levels of the ontic hierarchy in the physus. It is the peculiar characteristics of molecules and macro-molecules that allow these organism machines to form that self-produce and interact reflexively.

66. From this we see that there is a world of creatures, living things, animals, entelechies, souls in the smallest portion of matter.

Microscopes find that there is an end to organisms where is only physical matter at some smaller granularity. However, at some level there is a mixture of consciousness and matter within quantum mechanics.

67. Each portion of matter can be conceived as a garden full of plants, and as a pond full of fishes. But each branch of a plant, each member of an animal, each drop of its humors is also such a garden or such a pond.

It is only at the higher scales that this seeming infinite regress of organisms is true. But what is interesting here is that Leibniz is saying that the universe itself is alive as an organism through this nesting.

68. And although the earth and the air which are between the plants of the garden, or the water which is between the fish of the pond, are neither plants nor fish, yet they also contain plants and fishes, but most often so minute as to be imperceptible to us.

Where ever there is anything there are living things. Good hypothesis, but unfortunately not true. But it did allow him to unite the universe and the monad as both living in this way.

69. Thus there is nothing fallow, nothing sterile, nothing dead in the universe, no chaos, no confusion save in appearance, somewhat as might it appear in a pond at a distance, in which one would see a confused movement and, as it were, a swarming of fish in the pond, without separately distinguishing the fish themselves. (Pref. [GP V 40, 44])

Is this an intimation of the confusion of quantum mechanics on the micro level?

70. Hence we see that each living body has a dominant entelechy, which in an animal is the soul; but the members of this living body are full of other living things, plants, animals, each of which also has its entelechy, or its dominant soul.

There is he believes an infinite nesting of life in the ontic hierarchy. In other words the connection between monad and kosmos is inherited by the ontic hierarchy as well. The ontological hierarchy is alive within the ontic hierarchy. Matter is not wholly dead stuff.

71. But it must not be imagined, as has been done by some who have misunderstood my thought, that each soul has a mass or portion of matter belonging exclusively to itself or assigned to it forever, and that it consequently possesses other inferior living things, destined to serve it forever. For all bodies are in a perpetual flux like rivers, and parts enter them and leave them continually.

Here the emphasis is on flow not just on gestalts, on process not just on system. This is not a hierarchy of domination.

72. Thus the soul changes its body only little by little, and by degrees, so that it is never deprived at once of all its organs; and there is often metamorphosis in animals, but never metempsychosis or transmigration of souls; nor are there entirely separated souls or spirits without bodies. God alone is completely without body. (secs. 90, 124.)

Leibniz is not a Buddhist, he does not believe in transmigration of the soul. The Buddhists actually have a more interesting theory than Leibniz. They pose the question how transmigration can occur when everything is empty. The answer is the store house consciousness, i.e. the place in consciousness that stores the seeds of karma.

73. It also follows from this that there is never absolute generation nor, strictly speaking, complete death, involving the separation of the soul. What we call generations are developments and growths; what we call deaths are envelopments and diminutions.

This is a very interesting point. He does not believe in spontaneous generation nor in complete death. He believes that there is some marginal advance of the souls encroaching always on each other. That is an interesting idea and attempt to find some middle way between the extremes of ex nihilio creatio and annihilation. Rather we place our hopes in creation and annihilation in the extreme sense out of and back into the void or emptiness.

74. Philosophers have been much perplexed about the origin of forms, entelechies, or souls; but today when it has become known through careful studies of plants, insects, and animals that the organic bodies of nature are never products of chaos or putrefaction, but always come from seeds, in which there was undoubtedly some preformation, it is judged that not only was the organic body already there before conception, but also a soul in this body, and, in short, the animal itself; and that through conception this animal has merely been prepared for a great transformation, in order to become an animal of another kind. Something like this is seen even apart from generation, as when worms become flies and caterpillars become butterflies. (secs. 86, 89; Pref. [GP V 40ff]; secs. 90, 187, 188, 403, 86, 397)

There is a connection between the seeds and the monads. This goes along with the connection to the Emergent Meta-system formation hypothesized above.

75. Those animals of which some are raised by means of conception to the rank of larger animals may be called spermatic; but those among them which remain in their own kind (that is, the majority) are born, multiply, and are destroyed like the large animals, and it is only a few elect that pass to a greater theater.

He is right about the fact that there are many more seeds than those that fructify and mature.

76. But this was only half the truth: I judged,

therefore, that if the animal never begins naturally, it no more ends naturally, and that not only will there be no generation, but also no complete destruction or death in the strict sense. And these a posteriori reasonings, drawn from experience, agree perfectly with my a priori principles, as deduced above. (sec. 90)

So there is life after death, because there is no spontaneous generation. Clever.

77. Thus it may be said that not only is the soul (mirror of an indestructible universe) indestructible, but also the animal itself, even though its machine may often perish in part and cast off or put on organic coverings.

Souls are indestructible as is the universe.

78. These principles have given me a way of explaining naturally the union or rather the conformity of the soul and the organic body. The soul follows its own laws, and the body likewise follows its own laws; and they agree with each other in virtue of the harmony preestablished among substances, since they are all representations of the same universe. (Pref. [GP V 39]; secs. 340, 352, 353, 358)

There is a kind of parallelism or mirroring between the monadic souls and the bodies in the universe. Thus the universe through its souls and their bodies sets up a mirror. The mirror is the analogy of the special systems. Thus this is another indication that he has special systems in mind vaguely.

79. Souls act according to the laws of final causes through appetitions, ends and means. Bodies act according to the laws of efficient causes or motions. And the two kingdoms, that of efficient causes and that of final causes, are in harmony with one another.

Causes participate in this mirroring.

80. Descartes recognized that souls cannot impart any force to bodies, because there is always the same quantity of force in matter. Nevertheless he believed that the soul could change the direction of bodies. But this is because in his time it was not known that there is a law of nature which affirms also the conservation of the same total direction in matter. Had Descartes noticed this he would have come upon my system of preestablished harmony. (Pref. [GP V 44]; secs. 22, 59, 60, 61, 63, 66, 345, 346 sqq., 354, 355)

Conservation of momentum is the thing that would have changed Descartes mind to agree with Leibniz.

81. According to this system bodies act as if (to suppose the impossible) there were no souls, and souls act as if there were no bodies, and both act as if each influenced the other.

This is a picture of conjunction, as the dissipative special systems are conjuncted to form the autopoietic system and the autopoietic systems are conjuncted to form the reflexive special system. Dissipative systems are like two facing mirrors. Autopoietic systems are like three facing mirrors.

Reflexive systems are like four facing mirrors. Leibniz is appealing to mirroring which is the heart of the special systems metaphor. If you are going to self produce you need a mirror in order to see yourself so you know what to produce and maintain.

82. As regards minds or rational souls, though I find that what I have just said is at bottom true for all living things and animals (namely that animals and souls only begin when the world begins and no more come to an end than the world does), yet there is this peculiarity in rational animals, that their small spermatic animals, so long as they are only that, have merely ordinary or sensitive souls; but when those who are chosen, so to speak, attain to human nature through an actual conception, their sensitive souls are elevated to the rank of reason and to the prerogative of minds. (secs. 91, 397)

The difference between man and animals explained.

83. Among other differences which exist between ordinary souls and minds, some of which I have already noted, there is also this: that souls in general are living mirrors or images of the universe of created things, but that minds are also images of the divinity itself, or of the author of nature, capable of knowing the system of the universe and of imitating it to some extent through architectonic patterns, each mind being like a small divinity in its own sphere. (sec. 147)

There is mirroring not just between the universe and the monad but also the monad and god. This establishes not only the mirroring between schemas which live inside the ontic hierarchy but also the absolute which is divided into the spectra of the social and individual hierarchies. Thus you can see that Leibniz is talking about the same set of opposites that I have been discussing: finite physus/logos as opposed to the infinite or absolute. There is a higher mirroring not just with the universe but between the monad and god. This says that there are at least two levels of mirroring. We have instead posited three. There is the mirroring between monads. The mirroring with the universe as a whole. And the mirroring between monad and god. So Leibniz also has three levels of mirroring. The highest mirroring is reflexive. This is further proof that Leibniz is thinking about the special systems as through a glass darkly.

84. It is this that enables minds to enter into a kind of society with God, and makes it that, in relation to them, he is not only what an inventor is to his machine (which is the relation of God to other created things), but also what a prince is to his subjects, and even what a father is to his children.

Leibniz specifically talks about the reflexive mirroring between monad and god as social. This is further proof that he is talking about the special systems.

85. From this it is easy to conclude that the collection of all minds must compose the city of God, that is, the most perfect state that is possible, under the most perfect of monarchs. (sec. 146; Summary, Obj. 2)

God has a city of monads that engage in a reflexive mirroring in society with each other and god.

86. This city of God, this truly universal monarchy, is a moral world in the natural world, and is the most exalted and most divine among the works of God; and it is in it that the glory of God truly consists, for he would have no glory were his greatness and goodness not known and admired by minds. It is also in relation to this divine city that God properly has goodness, whereas his wisdom and power are manifested everywhere.

The moral world is the city of God. Nietzsche would argue with that. Nietzsche asks the question for the first time what is the value of values and denies all transcendences.

87. As we have shown above that there is a perfect harmony between the two natural kingdoms, the one of efficient causes, the other of final causes, we should notice here also another harmony between the physical kingdom of nature and the moral kingdom of grace, that is, between God considered as architect of the machine of the universe and God considered as monarch of the divine city of minds. (secs. 62, 74, 118, 248, 112, 130, 247)

There is also a mirroring between god as architect and god as monarch of the city of minds. God internalizes the mirroring and has a dual nature.

88. This harmony brings it about that things are led to grace by the very ways of nature, and that this globe, for example, must be destroyed and repaired by natural means at moments when the government of spirits requires it, for the punishment of some and the reward of others. (secs. 18 sqq., 110, 244, 245, 340)

This inner doubling of God as creator and moral god produces harmony but also brings wrath.

89. It may also be said that God as architect satisfies in every respect God as legislator, and thus that sins must carry their penalty with them, through the order of nature, and even in virtue of the mechanical structure of things; and likewise that noble actions will attain their rewards by mechanical means, in relation to bodies, although this cannot and ought not always to happen immediately.

Thus there is divine retribution after a delay.

90. Finally, under this perfect government no good action will go unrewarded and no bad one unpunished, and everything must result in the well-being of the good, that is, of those who are not dissatisfied in this great state, but who trust in providence, after having done their duty, and who love and imitate, as they should, the author of all good, finding pleasure in the contemplation of his perfections, as is the way of genuine pure love, which takes pleasure in the happiness of the beloved. This is what leads wise and virtuous people to devote their efforts to everything which appears in harmony with the presumptive or antecedent will of God, and yet makes them content with what God actually brings about by his secret, consequent or decisive will,

recognizing that if we could sufficiently understand the order of the universe, we would find that it exceeds all the wishes of the wisest, and that it is impossible to make it better than it is, not only for the whole in general but also for ourselves in particular, if we are attached, as we ought to be, to the author of the whole, not only as the architect and efficient cause of our being, but as to our master and to the final cause which ought to be the whole aim of our will and which alone can make for our happiness. (secs. 134, 278; Pref. [GP V 27, 28])

And so the argument comes to an end with beatitudes. But what is clear is that he had some idea of the special systems and the emergent meta-system which was the basis of the structuring of his arguments. The question is where did he get that understanding which seems to have been in Plato very clearly but which seems not to have been expressed except by Leibniz until Kierkegaard. It is an underground current within our tradition that seems to have no clear line of genealogy. Is it discovered over and over again? Or is there a genealogy of which the various philosophers that approximate it are conscious?