

INTERTWINING OF DUALITY AND NONDUALITY

Kent D. Palmer

Trace Studies Institute
Box 1632 Orange CA 92856 USA

ABSTRACT

Special Systems Theory and the theory of Emergent Meta-systems are articulated in my previous paper *Reflexive Autopoietic Dissipative Special Systems Theory*¹. This theory recognizes the profound relation between Duality and Nonduality. Nonduality is an oriental philosophical concept explained by David Loye in his book *Nonduality*². Basically, nonduality is a middle ground between unity and duality. It is not one and it is not two. Nonduality is the holonomic middle ground between unity and duality. Special Systems theory shows that there is a middle ground of this kind between the duals of a System (a whole greater than the sum of its parts) and the Meta-system (a whole less than the sum of its parts, e.g. environment or ecosystem). This nonduality expresses itself as three special holonic systems called Dissipative, Autopoietic and Reflexive. These special systems are defined by hyper-complex algebras and have physical phenomena that express their structure which shows that these are real possibilities within the natural world. Special systems are ultra-efficacious (ultra-efficient and ultra-effective) in relation to normal open or closed systems. Thus, they are rare anomalies. But when they appear, they take over and spread to all possible niches in the environment just as life did on earth. Dissipative special systems are neg-entropic. Autopoietic special systems are the systems theoretic template for life. Reflexive special systems are the template for social relations among living things. Each of these special systems are holonomic, i.e. they have properties like those that Arthur Koestler attributed to *Janus* faced holons. Holons are chiasmic and reversible non-duals that stand in the middle ground between duals. The Emergent Meta-system is a special kind of holonic formation that combines the three special systems with a normal system. It is a dynamic structure similar to a genetic algorithm by which a model of the meta-system is produced out of the interaction of the special systems. The meta-systems are distinguished from super-systems which are nested levels of systems. A meta-system is a deconstructed super-system and appears as a field out of which systems arise and through which they interoperate and cooperate. A meta-system is an environment or ecosystem for a certain level of system and anti-system pair. It is out of this milieu that holonic non-dual structures arise in anomalous and rare instances. The meta-systemic structures are a prototype for Gaia in which multiple species engage in Emergent Meta-system dynamics in relation to each other in a broader environment and thus create and regulate the cooperatively created environment that they share with other species.³

¹ This paper may be found at <http://server.snni.com:80/~palmer/autopoiesis.html>

² Loy, David, *Nonduality* : a study in comparative philosophy. New Haven : Yale University Press, c1988.

³ See also the following papers presented at ISSS2000: *Defining Life And The Living Ontologically And Holonomically in the What is Life and Living?* SIG; and *New General Schemas Theory: Systems, Holons, Meta-Systems & Worlds in the Research Toward a General Theory of Systems* SIG. References are given in the first paper where the reference is mentioned.

Intertwining of Duality and Non-Duality

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

INTRODUCTION

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

Intertwining of Duality and Non-Duality

NONDUALITY

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

Being is not a conceptual monolith, but as recent Continental Philosophy has discovered, it is fragmented into a series of modes of being-in-the-world. These various modes of being-in-the-world reveal various kinds of Being which are called Pure Being, Process Being, Hyper Being and Wild Being. They form a staircase of meta-levels of Being. This staircase does not go anywhere because the fifth meta-level is missing. When we try to think it, we fail; we cannot conceive it. It is unthinkable just like the difference between the both...and and the neither...nor. Both of these are ways to access existence. Existence is itself intrinsically empty, and we run directly into it when we try to move up through the meta-levels of Being. We can call the fifth meta-level ultra-Being because it moves beyond Being itself into Existence.⁴

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

⁴ Sankara's Avidya Vedanta, which is another non-dual philosophy, interprets Existence as a kind of Being in this way. We prefer to follow Nagarjuna who recognized that Being ends at the fourth meta-level. Whatever is at the fifth meta-level or beyond is maya or illusion.

Intertwining of Duality and Non-Duality

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

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

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

Intertwining of Duality and Non-Duality

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

On the other hand, if we accept the possibility of the supra-rational as the opposite of the paradoxical, then we will be able to understand nonduality. Nonduality is always supra-rational; this is a positive way of expressing the unthinkability of it. *The supra-rational is not irrational. That is to say, it is not a breakdown of reasoning but a transcendence of it. Reasoning is merely the production of arguments that attempts to establish motive or cause.* Irrational action or argument fails to establish reason or cause at all. Supra-rational argument is always based on silence. The Buddha was silent when asked about antinominal metaphysical opposites. This is a real meta-physical position which shelters itself in silence, similar to the kind of sheltering that Sextus Empiricus⁵ attempts when he tries to keep the dialectic going but also tries not to get caught up in it. The unthinkability of Existence is supra-rational, and because of that, it ends up bringing us to silence. If we are silent, the world does not vanish. So this is a real philosophical position based on the meta-physics of existence which appears as a viable alternative when we stop the projections of Being. After much silence, a few words may contain immense meaning when compared to endless chatter which is meaningless.

A TOPOLOGICAL ANALOGY

But how should we understand this duality between the Supra-rational and the Paradoxical? We are fortunate that there is an analogy in Mathematical Topology that will help us. That is the analogy of the series of non-orientable surfaces which has previously been explored by Steven Rosen⁶. We posit that the series of non-orientable surfaces called mobius strip, kleinian bottle and hyper-kleinian bottle⁷ give us an excellent lesson in the way that duality and nonduality intertwine emergently. We start off with the two-edged and two-sided lemniscate which, when joined together with another intertwined oppositely twisted lemniscate, gives you a one-sided and one-edged mobius strip. Then, when we take two oppositely twisted mobius strips and glue them along the edges, we obtain the kleinian bottle. Two kleinian bottles glued along their circles of interference, give you a hyper-kleinian bottle. When we look at the mobius strip, what we notice is that it is locally dual and globally non-dual. It seems to have two

⁵ Sextus Empiricus. Outlines of Scepticism. Translated by Julia Annas and Jonathan Barnes. Cambridge [England] ; New York : Cambridge University Press, 1994.

⁶ See "Wholeness as the Body of Paradox" at <http://focusing.org/Rosen.html>

⁷ A hyper-kleinian bottle joins two bi-toridal kleinian bottles along their circles of self-intersection. In other words where a toridal kleinian bottle has a figure eight cross section, a hyper-kleinian bottle has a four leaf clover cross section.

Intertwining of Duality and Non-Duality

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

As Steve Rosen⁸ points out, these figures teach us that it is necessary to have both duality and nonduality at the same time. In the mobius strip, it is a difference of local versus global perspectives that separate the distinction between two surfaces or edges from only having one surface and one side. The same is true of the kleinian bottle which makes the inside and outside similarly problematic as we switch from local to global perspectives. In the hyper-kleinian bottle, it is the self-other dichotomy that becomes ambiguous locally but globally unambiguous. Duality and nonduality always appear together as two sides of the same coin. Thus, Being and Existence, as the assumption of continuity and discontinuity, must always appear together. When we read this larger meta-physical context into what we learn from topology, we find that we can identify the lemniscate with the supra-rational and the ambiguity of the hyper-kleinian bottle's interlocked circles of self-intersection with paradoxicality. The lemniscate is dual, that is to say it really is two edged and two sided, both locally and globally, and we create it when we cut a mobius strip down the middle lengthwise. In the lemniscate, we suddenly break into an emergent level where the two opposites can be distinguished and nonduality vanishes. We get instead two interlocked lemniscates. We take this as the sign of the non-nihilistic naturalistic and non-extreme distinction between the two opposites that are supra-rationally interlocked. As soon as we sew them together, we get the mobius strip which has the non-orientability that signifies their nonduality which at the same time shows us their duality. As we proceed through the emergent levels, we eventually produce the paradoxicality of the hyper-kleinian bottle where we can no longer tell self from other, the opposites are mixed and contradictory rather than separated and distinctly defined while at the same time having a non-dual relation to each other.

Nonduality and duality are two ways of looking at the same non-orientable figure. Nonduality, when it breaks free from Being, produces non-nihilistic natural and non-extreme interlocked opposites. But as it moves up into Being, the mixture of the dual and non-dual increases in intensity until they become paradoxical mixture which is contradictory and chaotic. Being is ultimately a paradox, even an absurdity, i.e. meta-paradoxical. In order to try to come to terms with it in reason, we break it down using Russell & Copi's⁹ higher logical type theory. We produce the meta-levels of Being as a hierarchy to diffuse the mixture of paradox and viciousness of the circles within Being, and then at each level, we produce the various aspects of Being, i.e. truth, reality, identity, presence. Each aspect of Being has a different character at the various meta-levels of Being. This gives us sixteen facets of Being that is like a mobile which intersects with itself just prior to collapse into paradoxicality. Reason is the attempt to use all four aspects of Being together at a particular level of Being, i.e. Pure, Process, Hyper,

⁸ Rosen, S. M. *Science, paradox, and the Moebius principle*. Albany: State University of New York Press. 1994.

⁹ Copi, Irving M. *The Theory of Logical Types*. London, Routledge and K. Paul, 1971.

Intertwining of Duality and Non-Duality

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

ONTOLOGICAL DUALISM AND NONDUALITY

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

Intertwining of Duality and Non-Duality

by the kinds of Being, so that existence is intertwined intimately with the definition of the kinds of Being and vice versa.

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

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

Meta-system (sedenion algebra)	Lemniscate
Reflexive Special System (octonion algebra)	Mobius Strip
Autopoietic Special System (quaternion algebra)	Kleinian Bottle
Dissipative Special System (imaginary algebra)	Hyper-Kleinian Bottle
System (real algebra)	Hypersphere of ambiguity ¹⁰

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

¹⁰ This hypersphere is formed from the two independent circles of self-intersection of the two kleinian bottles that are joined to form the hyper-kleinian bottle as seen in four dimensional space.

Intertwining of Duality and Non-Duality

kleinian bottles that have the nonduality of inside and outside. When we unzip these, we get the separate mobius strips that have the nonduality of their two sides and two edges. When we unzip the mobius strips, we get the lemniscates which are interlocking duals, i.e. which makes a natural dualistic distinction which holds and is not negated by a global perspective. *A hyper-kleinian bottle is made up of four mobius strips or two kleinian bottles just like the reflexive special system is made up of four dissipative special systems or two autopoietic systems.* We can see the same kind of organization in solitons which form breathers, and we might suppose instantaton super-breathers¹¹ by a conjunction operation. There are several different physical and mathematical holonic hierarchies (holarchies) with this kind of structure which show us the nature of the Special Systems as embodiments of nonduality embedded in duality. We need to study these mathematical and physical structures which give us a deeper understanding of holonic construction, like the Cooper pairs of superconductivity¹². It is by searching out the holonomic anomalies in mathematics and in physical phenomena that we will be able to understand these non-dual structures and be able to find other examples in different disciplines. But our way will be hindered as long as we subscribe to the excluded middle as the basic metaphysical principle. We need to allow the non-dual realm of existence to show itself beyond our projections of illusory continuity through ideation. It is this illusory continuity, for instance, that attempts to establish the Copenhagen convention¹³ that the quantum mechanical phenomena only occurs on the microscale. *Instead, the non-dual approach establishes the possibility of macro-quantum mechanical phenomena which is suppressed by our worldview through the projection of Being on existence.* The model that David Deutsch proposes in The Fabric of Reality¹⁴ is much closer to our understanding of the nature of existence. But rather than seeing simultaneous physically real universes that are somehow isolated from each other, except for the interference at the quantum mechanical level, we see that the pluriverses are interpenetrating, and that the nature of this interpenetration as seen by the mind is emptiness, or sunyata, and thus is supra-rational. At the other end of the spectrum are the multiple worlds found by David Chalmers when he considers consciousness. This multiplication of worlds is because each of us may apprehend qualia differently. This multiplication of qualitative worlds has a similar nature to the suppression of multiple quantum worlds by the Copenhagen convention. We, instead, take the multiple quantal physical worlds and intersect them with the multiple qualitative worlds to obtain what might be called a Macro Quantum-Qualia Observer Mechanics, which celebrates the inundation of the pluriverse of existence into our lives instead of attempting to suppress it by our projection of illusory continuity through Being.

¹¹ In physics called multi-Monopoles. See Duality and Supersymmetric Theories, edited by David I. Olive and Peter C. West. Cambridge, U.K. : Cambridge University Press, 1999.

¹² Bardeen, John, Understanding Superconductivity. Philadelphia, American Society for Testing and Materials, 1964. Billings, Charlene W., Superconductivity : from discovery to breakthrough .New York : Cobblehill Books/Dutton, c1991. Blatt, John Markus. Theory of Superconductivity. New York, Academic Press, 1964. Bogoliubov, N. N.. The Theory of Superconductivity. New York, Gordon and Breach, 1968, c1962. Crisan, M., Theory of Superconductivity. Singapore ; Teaneck, N.J. : World Scientific, c1989.

¹³ Wick, David, The Infamous Boundary : seven decades of controversy in quantum physics. With a mathematical appendix by William Farris. Boston : Birkhauser, 1995.

¹⁴ Deutsch, David, The Fabric of Reality : the science of parallel universes-- and its implications. New York : Allen Lane, c1997.

Intertwining of Duality and Non-Duality

A GENERAL THEORY OF SCHEMAS

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

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

These emergent levels of schemas contain many dualities within them. Each level is related to the next in the same way that the Meta-system is related to the System. The holons appear between each of the levels. Each level gets its properties as a conjunction of the two adjacent levels. Each level is dual with the opposite level at the other end of the hierarchy. All of this duality within the ontological framework of the schemas that we project on existence gives us an insight into the utter complementarity of the holonic way of looking at things. There is a projection by which the ontological schemas are thrown

Intertwining of Duality and Non-Duality

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

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

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

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

Intertwining of Duality and Non-Duality

is the articulation that held sway in the mythopoeitic times and that this has changed in the meta-physical times inaugurated by Thales and Anaxamander into the dualism of Infinite/Finite at the deeper level and Physus/Logos at the higher level. Our view of the structure of the schema of the world must exist within this framework of dualities as long as the Metaphysical Era continues to reign. However, we can extend this series of dualities both downward and upward to produce the chain of bifurcations in Being as it exists in the Meta-physical Era. This chain of bifurcations consists of at least eight layers of dualities within which are nested non-duals which are normally hidden, but when we cease to project and allow the different duals to exist independently, they become manifest¹⁵ to the careful observer.

Particle	<i>Uncertain Complementarity</i>	Wave
Quantum Mechanics	<i>Spacetime</i>	Relativity
Physics	<i>InfoEnergy</i>	Thermodynamics
Physus	Orders	Logos
Limited	Rights	Unlimited
Have	<i>Goods</i>	Have not
Exist	<i>Fates</i>	Exist not
Actualize (paradoxicality)	<i>Sources</i>	Actualize not (supra-rationality)
Unmanifest = Extremal ¹⁶	<i>Root (Single Source)</i>	Manifestation

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

¹⁵ Manifestation is the deepest level of disclosure beyond Existence and Being. It is non-dual between Existence and Being. See An Approach Toward Being, Existence and Manifestation at <http://dialog.net:85/homepage/fe00v01.pdf>

¹⁶ The Extremal is the mixture of Paradoxicality and Supra-Rationality. It is the antipode to Manifestation. See "Autopoietic Meta-theory: Paradox and Supra-rationality" at <http://dialog.net:85/homepage/autopoiesis.html>

Intertwining of Duality and Non-Duality

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

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

Intertwining of Duality and Non-Duality

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

THE SECRET OF THE WORLD

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

Intertwining of Duality and Non-Duality

interlaced, and by an operation of joining, they reveal the nonduality that is hidden within their articulation. Similarly, the chain of Being has interlaced dualisms that we disengage. Where has the nonduality gone? It has gone into the discontinuities between the interlaced lemniscates. The discontinuities hide the non-duals, so the supra-rational is a marriage of the dual and the non-dual which allows the duals to be seen on the background of the non-dual discontinuities. Thus, the discontinuities between natural opposites hide the nonduality which is a background for the manifestation of duals. The bifurcation of two-sided and two-edged lemniscates can go on indefinitely within this non-dual environment of discontinuities. This is precisely the way it is with the structure of the world in general. It is made up of myriad dualisms which revolve around the core of the chain of Being which arises out of existence and actuality from the root. But within this chain non-duals are hidden. At the level of Being these non-duals are *nomos*, or order, and *arte (rta)*, or right. Right allows us to comprehend the balance between Being and beings which called ontological difference. In the comprehension of that balance, both individuals and society differentiate themselves at various emergent levels by which knowledge is constructed or invented about the world. But up at the level of *nomos*, we find a separation between the ontological schemas and the ontic phenomenal coherences at various emergent levels. Almost any schema can be applied to any level of phenomena. The phenomena appear different depending on what schema we use to attempt to comprehend them. Various combinations of schema give us particular insights into the phenomena that other combinations do not. Thus, the schemas, when brought into conjunction, have an illuminating effect which are not necessarily implicit within the phenomena themselves as ontic realities. The phenomena are what Cornelius Castoriadis calls *magma* upon which we project our categories in the process of social institutionalization, construction and invention. We need to allow the magma to be just that, undifferentiated yet still distinguishable in multiple ways depending on what schemas we bring to bear. We need to allow the schemas to interact with each other so that their special illuminating effects can be seen with respect to various phenomena. It is by this means that the emergent transformations occur at the various social levels that we experience as paradigm shifts, episteme changes, transformations of our interpretation of Being, and new perspectives on existence. There is only one meta-physical principle, but myriad sorts of suchness. That suchness is differentiated into *logos* and *physis* and is inspissated by Being as it differentiates the myriad beings into those that have their being in *physis* or *logos* or both as we do. What we realize is that the ontological hierarchy and the ontic hierarchy are two different ways of looking at suchness as it is saturated by the Absolute which we, in our tradition, interpret fatefully as Being. We only see the supra-rationality of existence by separating everything, underneath every being is an existant which we see by interpreting them in terms of neither this aspect nor its opposite. Thus, every existent is neither true nor false, neither real nor unreal, neither present nor absent, neither identical nor different. To interpret them in the opposite way produces the quintessence, i.e. both present and absent, both identical and different, both real and unreal, both true and false. When we lift the barrier of the excluded middle, both existence and the quintessence become possibilities for looking at the world. The quintessence¹⁷ sees the world in terms of the fusion of the holoidal, in which everything is real, true, identical and present, i.e. the monolith of Being, and opposite, i.e. the

¹⁷ Called by the Alchemists the Philosopher's Stone (Lapis).

Intertwining of Duality and Non-Duality

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

We get some inkling of this when we look at the ontological emergent hierarchy. In that hierarchy, as Onar Aam has pointed out, there are facets which are wholes that cannot be parts, like quarks, and there is, at the other extreme in the pluriverse, parts that cannot be wholes, like the whole universe which we cannot see the edge of and which we are embedded in. Holons, like the intermediate levels of schema, are both wholes and parts at the same time. They are composed of wholes-that-cannot-be-parts and parts-that-cannot-be-wholes juxtaposed with each other. The opposite of the holon is the holoidal or the hologram which is a partial part and a partial whole in which multiple perspectives see partial views of both part and whole. When we think about it, the denial of part or the denial of whole can be slid up and down the ontological hierarchy¹⁸. Thus, any adjacent layer on either side can be seen as a whole that has no parts or a part that cannot be whole. When we consider this carefully, we realize that this means intermediary concepts are necessary to produce the holon in the middle which gives the part what it needs to become whole or gives the whole what it needs to become a part. Looking at these intermediate concepts, it becomes clear that what is at play is our concepts of countable and non-countable things. We see the higher level as a mass which needs a bound in order to have part instances. We see the lower level as something countable that has attributes to which we add a universal to allow the part particulars to become whole. At each level, there is the upper level mass and the lower level attributes that, through bounds and universals, become instances and particulars. The particular instance is the holon which is at once the part and the whole forged out of the part-that-cannot-be-whole, like the pluriverse, or the whole-that-cannot-be-part, like the facet. The bound allows the mass to become an instance, and the universal allows the attribute to become a particular. The particular instance is the holon between these two adjacent levels. Bob Cummings realized that the parts that cannot be wholes and the wholes that cannot be parts could slide up and down the ontological hierarchy producing limits at any level. For our purposes here, this could relate to the meta-system and the system. The meta-system is considered as mass, or non-countable, while the system is considered as countable. By using the bound and universal that mediate these limits to the Holon, we see the special systems between the two adjacent schematic levels.

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

¹⁸ This insight came from Bob Cummings.

Intertwining of Duality and Non-Duality

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

ACKNOWLEDGEMENTS

Would like to thank my mentor Ian Dallas, as well as Ben Goertzel, Onar Aam, Bob Cummings and Owen Ware.

ABOUT THE AUTHOR

Kent Palmer is a Principle Systems Engineer at a major Aerospace Systems Company. He has a Ph.D. in Sociology concentrating on Philosophy of Science from the London School of Economics and a B.Sc. in Sociology from the University of Kansas. His dissertation on The Structure of Theoretical Systems in Relation to Emergence¹⁹ focused on how new things come into existence within the Western Philosophical and Scientific worldview. He has written extensively on the roots of the Western Worldview in his electronic book The Fragmentation of Being and the Path Beyond the Void²⁰. He had at least seventeen years experience²¹ in Software Engineering and Systems Engineering disciplines at major aerospace companies based in Orange County CA. He served several years as the chairman of a Software Engineering Process Group and is now engaged in

¹⁹ <http://server.snni.com:80/~palmer/disab.html> You may also try <http://dialog.net:85/homepage/> or <http://think.net/homepage/> for any of the web related material.

²⁰ <http://server.snni.com:80/~palmer/fbpath.htm>

²¹ <http://server.snni.com:80/~palmer/resume.html>

Intertwining of Duality and Non-Duality

Systems Engineering Process improvement based on EIA 731 and CMMI. He has presented a tutorial on “Advanced Process Architectures²²” which concerned engineering wide process improvement including both software and systems engineering. Besides process experience, he has recently been a software team lead on a Satellite Payload project and a systems engineer on a Satellite Ground System project. He has also engaged in independent research in Systems Theory which has resulted in a book of working papers called Reflexive Autopoietic Systems Theory²³. A new introduction to this work now exists called Reflexive Autopoietic Dissipative Special Systems Theory²⁴. He has given a tutorial²⁵ on “Meta-systems Engineering” to the INCOSE Principles working group. He has written a series on Software Engineering Foundations which are contained in the book Wild Software Meta-systems²⁶. He now teaches a course in “Software Requirements and Design Methodologies” at the University California Irvine Extension. He may be reached at palmer@think.net or palmer@exo.com.

²² <http://server.snni.com:80/~palmer/advanced.htm>

²³ <http://server.snni.com:80/~palmer/refauto2.htm>

²⁴ <http://server.snni.com:80/~palmer/autopoiesis.html>

²⁵ <http://dialog.net:85/homepage/incosewg/index.htm>

²⁶ <http://server.snni.com:80/~palmer/wsms.htm>