toward a common description of logical structure in science & religion:

formal structure of unity (wholeness) and distinction logics

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Working Title: TOWARD A COMMON DESCRIPTION OF LOGICAL STRUCTURES IN SCIENCE AND RELIGION: FORMAL STRUCTURE OF UNITARY (WHOLENESS) AND DISTINCTION LOGICS

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Introductory note: The CTNS invitation offers an opportunity to begin to write an introduction to an area of inquiry in which I have been working to develop, and which is offered here has an invitation, in turn, to begin a more critical discourse on the ideas involved. It is hoped that the topic both proves of interest to you, and that the work to date may, though such discourses as this, evolve into a critical research possibility. I have been fortunate to have had some series of conversations, which have allowed feedback and judgement, and for this many thanks are due.

I have tried to give this overview without introducing the technicality of the formalism. I hope the architecture of the endeavor is clear. This is a paper on the study's approach, with only a few conclusions or applications given as illustration -- for arguments toward conclusions must rest on more foundation than that sketched here.

I apologize that this paper is essentially a first draft version with its editing limited by the time at hand. I hope that typographic errors are minimal. The written work preceding this paper is built around exploration of the technical notation. Thank you.

SECTIONS

I. INTRODUCTION

IA. Ursula Goodenough writes in a very recent review (in American Scientist, May-June 1999, p. 264) of Stephen Gould's new book Rocks of Ages: Science and Religion in the Fullness of Life,

> "My sense is that each [religious] system is based on some sort of cosmology -- God is in covenant with the Jews, Jesus is the redeemer, The Buddha shows us the path to enlightenment -- cosmologies that are rendered in poetry and art and texts and are thereby infused with meaning and value. Ethical precepts then flow from these cosmologies, whether via the direct revelation of religious visionaries or by subsequent Talmudic-like inquiry: The precepts are invariably embedded in the central account of the story." (p.265)

In her critical analysis of Gould's position (Which is one which would seem to fit the "Independence" category of Barbour; Gould making a sharp delineation between methods of reaching meaning and value -- the religions, and physical descriptions -- science), Goodenough emphasizes the need to draw religious meanings which are compatible with science since science is our current giver of cosmologies.

> "Again, the real difficulty is that both sets of questions [i.e. *meaning* (why existence?) and *ethics* (how to live given existence)] must be addressed in the context of an overarching cosmology.... [and science] provides much of the *what* for the *why* and *how*." (p. 267)

IB. Goodenough's positions may serve as a starting point for this paper which concerns the logical structures -- or better the structural requirements -- of cosmologies arising in both science or religion. Although it is somewhat difficult to write this problem statement since the study involves several dimensions, nevertheless, the central exploration can be summarized as having two main parts -- both ongoing. . One is to compare the broadest features of both scientific and religious world descriptions to look for commonality in their logical structures. Are there common logical requirements which must be met in the structuring? Two, essentially the inverse task, is to see if a formalized language can be developed which is applicable to such structures. Can, from a common logic, statements in different world descriptions be demonstrated and ordered to each other?

In particular, I am interested in applying a common logical form to relate the frames of dualistic and non-dualistic philosophies. The proposed study is cast directly in terms of formal "distinction logic" as it appears in the language of the mathematical sciences and physics, and in terms of "unitary" logic, drawing here primarily from Advaita Vedanta.

IB1. Physics demonstrates a rigorous study of distinguished parts increasingly pointing to an unitary wholeness. Historically, physics has evolved from articulating relations between distinguished and mutually independent variables to synthetically unifying variable pairs or groups. Unifying pairs and groups (e.g. space-time) point to a "meta-unity" at base to even the synthetic levels. It is important to note that the wholeness pointed to in physics is done so by, and from, the perspective of tools developed to handle independent distinctions. Injunctive descriptions (i.e. injunction implies replicability) are empirically and mathematically rigorous, but philosophically non-unique. Therefore, the pointed-to wholeness falls outside of the domain of the tools themselves, and hence appears paradoxical in any description built on distinction.

IB2. Advaita Vedanta, as a unitary-model (one with many points parallel to concepts in Buddhism), runs in the other direction, namely from unitary wholeness to distinction. It also recognizes that experience leading toward knowledge of unitary wholeness starts on the side of distinction. Injunctive descriptions therefore embrace logic, paradox, and emphasis on non-rational knowing.

IC. One may expect a discourse or cosmology which has developed to reflect either one or the other end, to be fairly well defined and correct in reflecting that end, and to be more speculative, or less "robust" in its extrapolation to the other end. By correct is meant that the expression is to be descriptively consistent to the experience of, or formalization of, insight gained via a discipline focused on that end.

In our own approach here, distinction logic and unitary logic will be taken as conceptually equally valid. One perspective is not, a priori, preferred with the other being judged an error of inference or experience. We are not considering whether either starting perspective is ontologically more correct than the other. We wish to consider the form of discourse used in each. Are there

similar structural, or rather relatable structures, to the discussions in both cases which may be common to each other, independent of any prejudged ontological correctness of contents?

We are to see if there is an over-arching structured model, which may be formalizable to some degree and which so relates both poles of discourse. In a "nutshell," can a single logical structure can be demonstrated fitting both from myriad distinctions to wholeness as from wholeness to myriad distinctions. This approach would provide a framing for theological questions as well as those of physics and non-dual philosophies. This is done in the interest of strengthening the science-spiritual dialogue.

This study requires answering the question of how one may frame a logic of wholeness in a way that is meaningful. I have called this the problem of "paradoxical wholeness," in that wholeness requires a meaningful rendering of the statement [A and notA] in a way which also admits the logical requirement [either A or else notA]. The answer I have attempted is to essentially embed distinction logic into a wholeness logic based on (broadly speaking) the wholeness logic of Advaita Vedanta. An image one may use is that of a "flower" with petals separated at the top -- but all one at the stem: the open petals represent distinction logic, the stem, wholeness logic. The logical approach and formalism I am attempting keeps the "flower-like" relations explicit so that levels of logic may be operationally expressed together. The notational approach to this formalism builds on the work of the mathematician G. Spencer-Brown (Laws of Form). I feel I have developed to date, the core of the formalism. I am testing it, in limited ways, with respect to concepts in physics and religion. The wish here is to offer an overview into the spirit of the inquiry, hopefully also showing the way into the technical aspects, without becoming a technical paper.

IE. Postulates of the study:

1. Divergent world models can be spanned by a single logical architecture.
2. The architecture is amenable to formalism
3. The architecture spans both unitary and distinction logics
4. Features of world views can be characterized within the formalized architecture, and conversely, the architeture can be tested against world models.

II. I-KNOW-IT as a trinitarian concept, and various approaches to reality:

The purpose of this section is to give a quick introduction to nondualistic and unitary modelings of existence which support dichotomous conclusions of a "conscious" based versus a "physical" based universe. The attempt in these notes here is simply to illuminate the reasonableness of a wide range of philosophical positions and give a sense of some current thinking.

IIA. A cosmology speaks of a reality. That is, a cosmology gives us a reality. It is a reality we are to know. So the broadest frame for our query is the declaration "I know {the object of my knowing}." "I know the real." " I know it." The trinary relationship, *I-Know-It* is a simple sentence but one which expresses the profundity of self-conscious awareness and suggests the difficulty of deciding what cut in the trinary relation best should be ascribed as denoting "actuality", "reality", or "objective reality." Different cultures, philosophies, experiences, may lead to different ideas for the cuts -- or even if there should be cuts at all. This is our starting point.

For example we have the possibility of finding that *I* and *know* are of one principle which forms a completely separate category from the *notI*, i.e. from a physical nature (*it*). A descriptive language may become that of soul/body, or on the cosmic level, Purusha/Prakriti in the Sankhya school of Hinduism. Classical science builds on the strict dualism of complete subject/object distinction.

Another possible grouping may be to find that both *I* and *know* are actually complexities arising in, and describable in terms of, objective (impersonal) physics (*it*). Another may be solipsism -- nothing exists or is real except the experience of/in the individual self (*I*). Yet another that a (Buddhist-like) principle of "knowing" which projects both the ego-self (*I*) and the "objective" world (*it*).

IIB. The varied positions may necessarily become schools of teachings and practices supporting what is to be known by various forms of methods of knowledge which are accepted as valid. But method cannot be "blind" to what is to be demonstrated. Swami Satprakashananda states in *Methods of Knowledge According to Advaita Vedanta* (p. 64)

> "...epistemologists have tacitly assumed without criticism certain theories of reality on the truth of which alone their epistemological conclusions can stand.... Is it not better to express the metaphysical grounds and confess plainly and honestly that the final guarantee of these epistemological theories would come from the truth of the metaphysical assumptions? In such cases metaphysics and epistemology have to be considered in relation to each other."

For this paper, we may call those epistemologies "scientific" which build-in a proposition of falsifiability -- that is a proposition which supports the direct role of demonstrable knowing within its metaphysics.

IIC. In Figures 1, 2, and 3 we briefly summarize the situation associated with the physical sciences. Figure 1 shows "chains" of conceptual links arising as science develops. Figure 2 shows a time-line of subjects as they have become scientifically tractable. These two figures taken together represent a dilemma. In figure 2, we represent in the lower right-hand corner the current work on life, neuroscience, AI, and a projected tractability of "solving" the riddle of conscious. All of these,

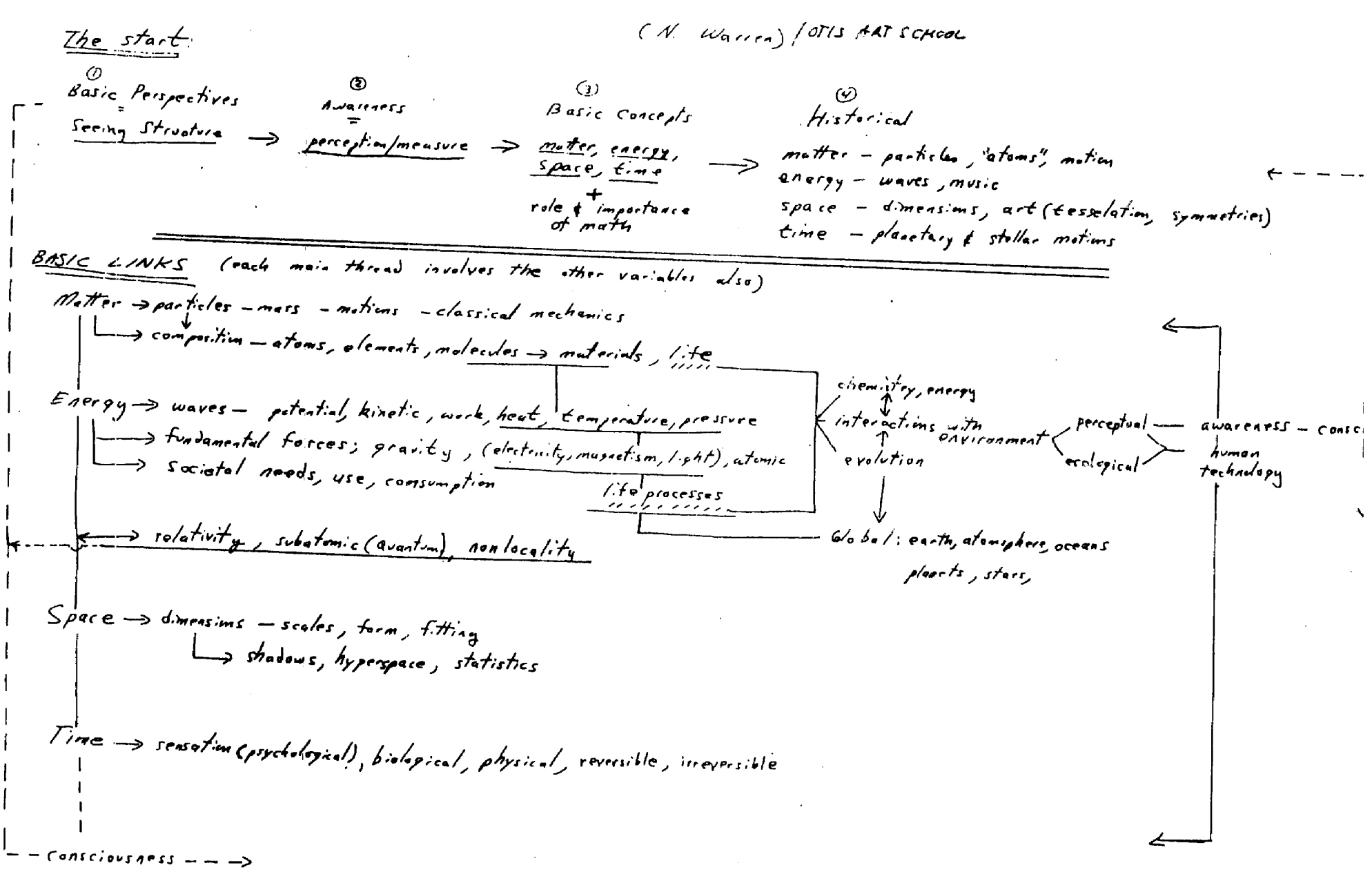
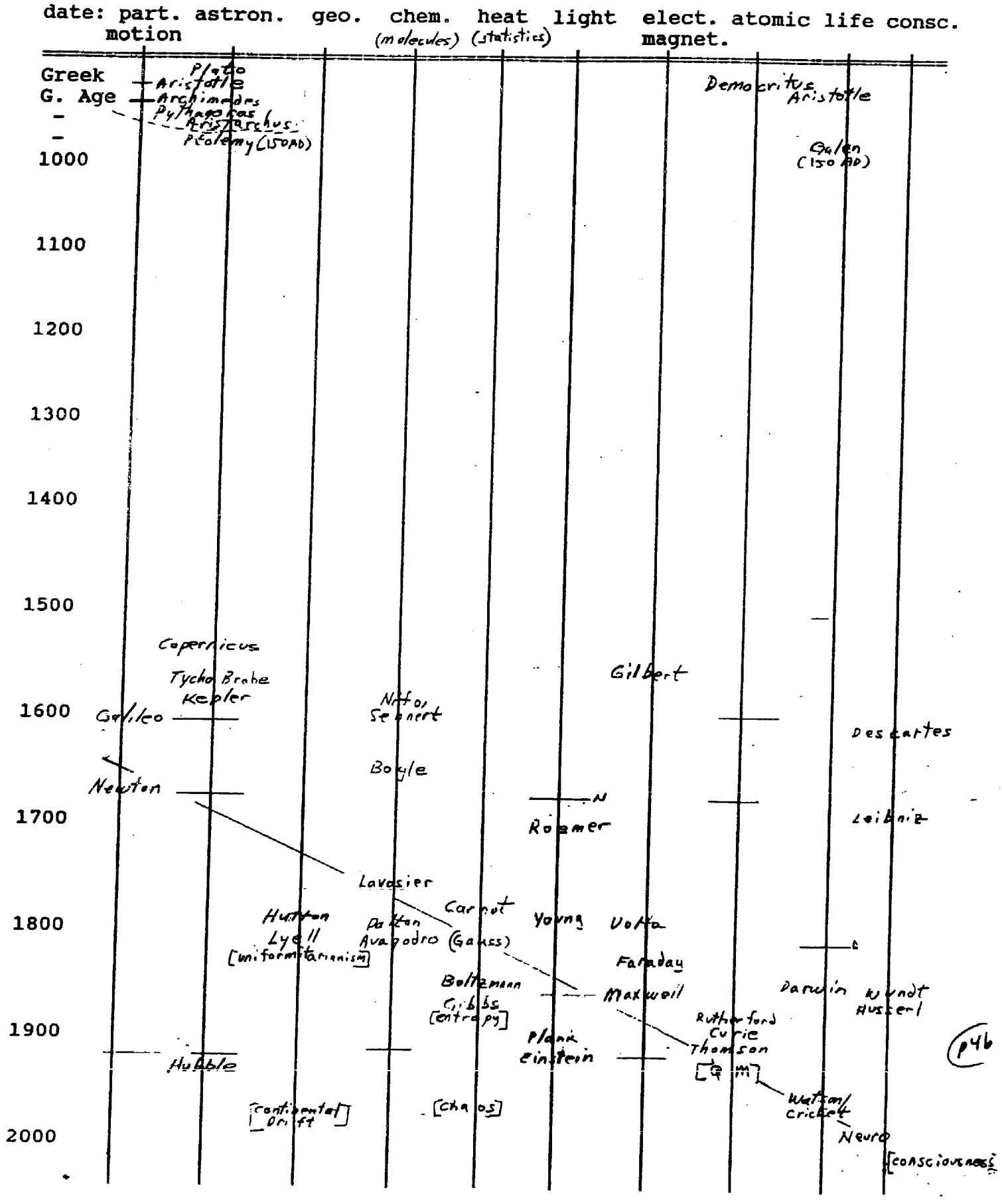

The start
(N. Warren) / OTIS ART SCHOOL
① Basic Perspectives = Seeing Structure
② Awareness = perception/measure
③ Basic Concepts
matter, energy, space, time
+ role & importance of math
④ Historical
matter – particles, "atoms", motion
energy – waves, music
space – dimensions, art (tessellation, symmetries)
time – planetary & stellar motions
BASIC LINKS (each main thread involves the other variables also)
Matter → particles – mass – motions – classical mechanics
→ composition – atoms, elements, molecules → materials, life
Energy → waves – potential, kinetic, work, heat, temperature, pressure
→ fundamental forces; gravity, (electricity, magnetism, light), atomic
→ societal needs, use, consumption
life processes
chemistry, energy
interactions with environment
evolution
perceptual
ecological
awareness – conscious
human technology
→ relativity, subatomic (quantum), nonlocality
Global: earth, atmosphere, oceans
planets, stars,
Space → dimensions – scales, form, fitting
→ shadows, hyperspace, statistics
Time → sensation (psychological), biological, physical, reversible, irreversible
– – consciousness – – →

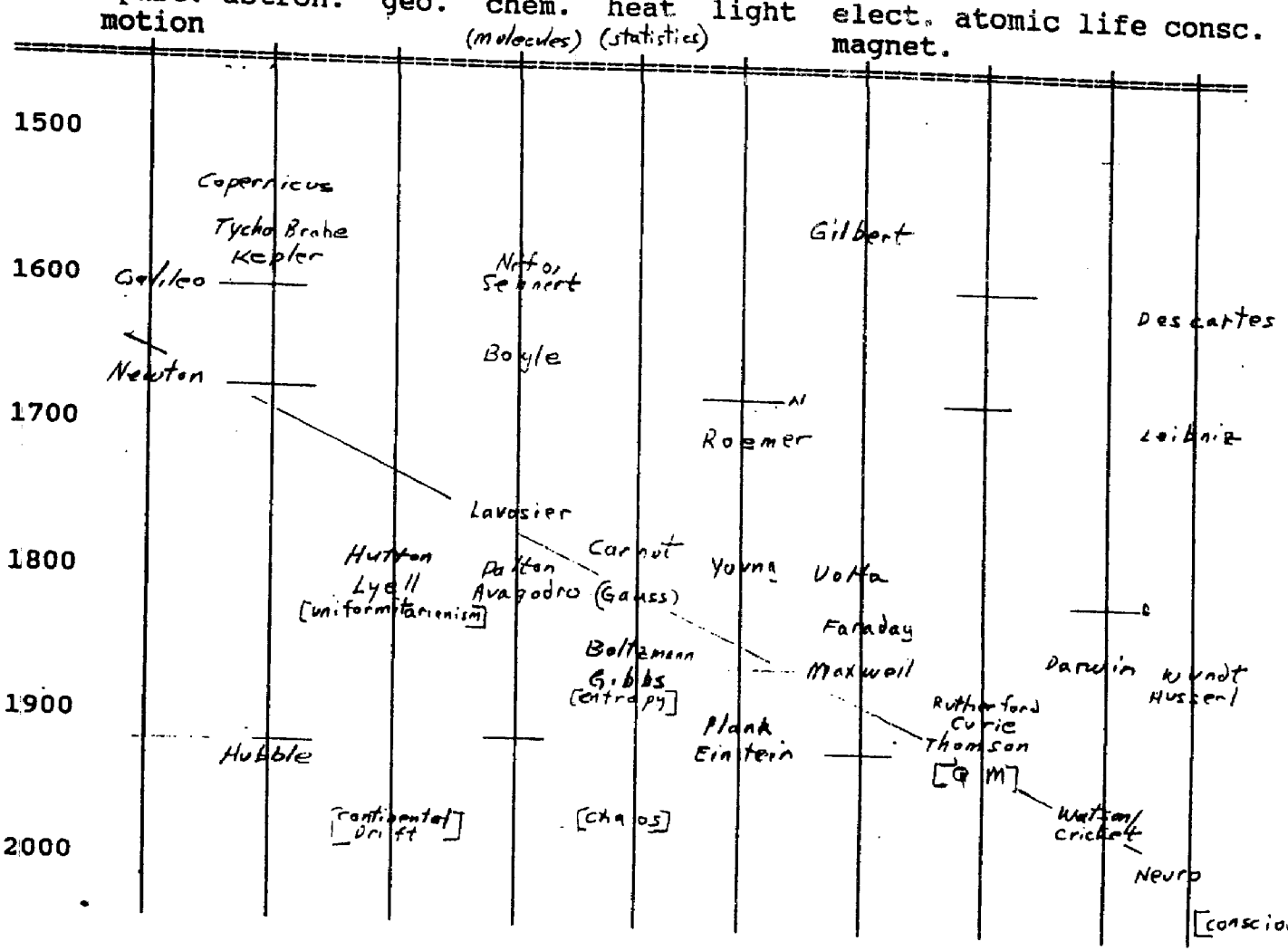
Fig 1

Time Line of Classical and Modern Science

Fig 2



Time Line of Classical and Modern Science



in this diagram, and indeed in current research are seen as fitting within a physics. *I* and *know* are hierarchies within (or even only epiphenomena of) the physics which is *it*.

Figure 1, on the other hand, points out the lack of closure to being able to realize a "blindly" physical interpretation of reality. Relativity, quantum mechanics, and the confirmation of nonlocality in quantum events, reopen the profound question of "What is existence?" at the level of asking where the a cut may be made in *I-Know-It*.

Figure 3 highlights this simply by showing the historical trend (via figure 2) of determinism, classical indeterminism (which represents an epistemological indeterminism only -- i.e. on limits on knowing) and quantum indeterminism (which is a combined epistemological and ontological indeterminism). That is, in some profound way, *I* and *know*, themselves may be profoundly cores of cosmologies.

In reflecting on this, in 1956, the physicist Erwin Schroedinger (who in 1926 developed the wave equation characterizing the wave-particle duality stated in a talk:

> ..I call the arithmetical paradox; the <u>many</u> consciousness egos from whose mental experience the <u>one</u> world is concocted...
>
> There are two ways out of the number paradox, both apparently rather lunatic from the view of present scientific thought....One is the multiplication of the world....[the other is] the unification of minds or consciousness. Their multiplicity is only apparent, in truth there is only one mind. This is the doctrine of the Upanishads. {Schroedinger [1956] 1980, 138-139)

IID. If a unitary principle is to be asserted, then there must be emergent hierarchies of complexity by which the principle manifests the multiple. This is true in Vedanta, as we will come to later, and is true in current science and theological developments.

IIE1. Newer efforts have been made to place observation within a physics. In physics itself these include information theories, in which information is an objective parameter much as matter or energy. Other approaches speak of complex adaptive systems including those postulated by the physicist Gell-Mann And Hartle. The paradox of the subject-objective distinction, as it were, reappears in new guises.

IIE2. As an example in theology, a recent conference at CTNS was focused on the issues of removing mind/body dualism by adapting a nondualistic "physicalism." It is worthwhile to briefly review some of the conference comments here.

Theo Meyering spoke of the "extreme philosophical positions" of Descartes' mind/body dualism and of "Radical Unitary Reductionism" (i.e. a stance in which everything is reducible to physics -- in the language of physics). He pointed out that in the complexity of the experienced world in which we live we find apparent (or at least practical) hierarchies which may or may not be reducible to "lower" levels -- irreducible either in terms of properties or appropriate descriptive language.

The problem, as discussed centrally addressed by Nancy Murphy, becomes how to have a higher level property such as mind, emerge from and be also be irreducible to its lower source (e.g. neurobiological) level. The Mind's irreducibility may be asserted if it can be demonstrated that the mind can act on -- supervene* on -- physical brain states by "downward causation." (for example from the mathematical truth of 2+2=4 to the corresponding brain activity of solving 2+2=?).
[* = Supervention and Downward Causation: more complex levels can "reset" processes or functions in the lower levels on which they depend and so sustain (and maximize) characteristics of the its own level.]

If we see <u>strict duality</u> as an irreducible binary pair (e.g. 0/1, Cartesian mind/body) or generalize it to mean absolute irreducible pair-terms of distinctions, then a hierarchy of complexity is

reducible if the more complex forms are reducible to lower hierarchical levels plus necessary bridge statements. Else such a level is irreducible. Note though, with respect to the notion of strict dualism, the definition of irreduciblitiy yields an absolute distinction to the level. Dualism appears in another guise.

Reflecting on the conference approach, there are two important points for our discussion here: (1) that all of the issues were cast in terms of "physicalism;" the "lowest" level being physics -- here meaning, material physicality, in which mind is a higher order information processing agent which embodies the property of downward causation needed for any "free-willed" action. The cosmological meaning of non-dualism in such a case as here is intrinsically that the dualism to be unified is of a complexity level (which comes about as an evolution of some closed, complex, self-reacting super-system) to the system of in which it occurs.
(2) It is not an unitary principle at the level of fundamental "Being" or existence out of which myriad can arise -- that is preceding complexity. In theology, God is such a unitary principle. In physics, something is hinted at by the found unifications of space, time, energy, matter, of "forms" before "wave" or "particle" and by nonlocality. In Advaita Vedantic terms this meaning of unitary principle is from a "subtle state" out of which can manifest the "gross state."

Returning to the conference notes, Francisco Ayala pointed out the need to discuss consciousness directly, a concept which had been avoided in the evening dialogue. "Practical" or experiential consciousness was then addressed by Warren Brown. He discussed the power of self-referential focus and described that in psychology:
(1) self-representations can be formed and focused on, and that self-representation is likely a culturally learned representation.
(2) Internal attention gives a person the strongest ability for top-down effect (self-conscious intent).
(3) That self-representation (focus on self-symbol) is the strongest conditioning of "free-will" -- calling "free-will," here, the liberty to act spontaneously and also the liberty of indifference (taking no action).
(4) That self-transcendence may occur when a person has "peaked" out by self-attention.

As responder, Mark Richardson emphasized the since Prof. Brown's position is that of a "phyiscalist" that "agent" and "action" could better replace "self" and "free-will". But he did also note, as if opening a whole other context, that "Consciousness" is a major concept in our description of God and of person, and asked whether the metaphor of consciousness is the only metaphor we have for a Personal God. Is *His* Consciousness Required? In his query, consciousness now reappears at the level of (an a-material) God.

IIF. To the extent that physicalism is built on "materiality", it is I believe, a "road stop" only, for materiality disappears in physics itself. Physics itself has been the science field which as reached its own paradoxes with respect subject/object (I-Know-It) as an absolute distinction pair. To ground hierarchy and complexity on physicalism -- apparently meaning on complex systems of sensible material, does not address the subtle and apparently unitary quality of the existence that physics points to in its own observations.

The other end point for a unitary principle is consciousness itself. Taking the conference notes in the direction of consciousness, Warren Brown's comments on self-attention give an apt description of Buddhist and Yogic statements to which the tools of knowledge are fundamentally recognizing and development inner attention. In this end, the unitary principle reached is Consciousness (not necessarily our daily experience of being aware). With regards to Mark's comments, this consciousness is not of a synergistic level of physical complexity, but the fundamental of objective and subjective existence. The next section will expand on this as part of

an overview of introducing unitary principles admitted by Advaita Vedanta.

IIG. I close this section by emphasizing from it a sense of what I mean by an *unitary logic*. An unitary logic must offer complexity -- dichotomous dualities -- as compatible to/within an unity (the Tao symbol comes to mind). The unitary principle must be at the level of first principle. At the level of a cosmology, *I-know-It* must itself be unified. Statements of unitary logic have been offered in various forms within Eastern Philosophies, by Western and Eastern mystics, and (to some interpretators) in Jesus's teachings themselves (although with the teachings cast in more paradoxical distinction language), and in John's Gospel, and in concepts of the Trinity.

> "The divine nature is Oneness and each person is One, the same One in nature. The distinction between being and existence is referred back then to the One, where they are all the same thing.... The One remains the same One in thousands of stones as much as in four stones: a thousand times a thousand is just as simple a number as four."
> (Meister Eckhart)

III. VEDANTA and ADVAITA VEDANTA

Vedanta is one of the six Darshanas or systems of orthodox hindu schools of thought. The term "Vedanta" refers to the philosophical portions (the Upanishads) of the corpus of Indian Scriptural literature known as the Vedas. Three main schools of thought in Vedanta are dualism (Dvaita), qualified non-dualism (vishishtadvaita) and nondualism (Advaita Vedanta).

Advaita Vedanta declares that the manifold universe is a "misreading" of the one ultimate Reality. (this reality is regarded as *Brahman* when regarded as transcendent, impersonal, beyond all attributes, *Atman* when considered immanent, and *Ishvara* when personal, with attributes as one who can be considered. Ishvara's "is the highest possible reading of the Absolute by the human mind." -- His three aspects with respect to the universe are Creator (*Brahma*), Preserver (*Vishnu*), and Destroyer or dissolver (*Siva*). Vishishtadvaita (founded by Ramanuja) teaches that all living creatures and non-living matter are parts of Brahman, who is their soul and controlling power. In Dvaita, man as a creature, and God as the Creator are considered separate from each other.

Advaita means "non-dual" or monistic and translates as, and asserts strict monism -- that the entire universe is an expression of/in a single Monistic Principle. The Divine Monistic Principle is pointed to as "One without a Second," as also by the epithet *Satchitananda* [Pure Existence (Sat)--Pure Consciousness (chit)--Pure Bliss (Ananda)]. The semantic structure of *Satchitananda* may appear to resonate with the trinitarian *I-Know-It*: the subjective knowing of self (ananda), the knowing (Chit) and that-which-is (Sat). But here it is fully a unitary principle. Sat is not the Other from the Self It is All, as Pure Existence-- Pure Consciousness--Pure Bliss.

In Advaita Vedanta, one may see the personsl self, and the entire universe, as an "illusion" upon the Real or Monistic Principle. The universe and oneself, however, are none-the-less real in that we are alive, and live in it knowingly. Thus Brahmans Power, *Shakti*, manifests "Illusion." Shakti as "*Maya*" is generative in that She becomes the creation of the world and of our individuality. Maya is "negative" in that it (through the illusion of the world, or our ignorance) hides or occults the numinous Reality. And it is "positive" in that is the "mirror" through which we know Reality.

The Dynamic Principle which gives rise to this Illusion must logically be the power of the Monistic Principle itself -- when expressed. Perhaps "...And the Word was with God" in the Gospel According to St. John is a strong parallel (see next section). Here, thus, we have the expression of a Monistic Principle with inherent quality of Power. Brahman the Absolute, One without a second, is also (expresses as) Brahman/Shakti in so far as the universe exists at all.

IV. PRIMARY LEVELS TO MODEL

In this Section, I wish to summarize three "levels" of our model which must be made accessible to formal expression; Wholeness, Emergence, and Logical Distinction or Dualism. It is important to note that "level" here is simply a term of convenience, as would be "hierarchy.' [In my more developed writing I introduce the terms "foliation' and "transvolution" to more adequately express the concurrence of these levels as singular.]

IVA. WHOLENESS:

Many religions, in their teachings, point to a level that is "before", "behind", "transcendent to"; a

level which is, in short, simultaneously unknowable, non-conceptualizable, and yet the "ground", "root" or actual Reality of all we experience and know as phenomenal existence. It is outside of space-time-causation. A possible need for such an enigmatic ground-to-reality has, likewise, been found as an implication in modern physics. That this level is "outside" positive description evokes, in religious or spiritual writings, the common approach of negation -- what it is Not.

Paradoxically to *Not-this*, it is also *All* -- hence a truth which cannot be understood in terms of any, or even the totality, of its parts. In this position, it becomes a statement of everything while being excludable from every phenomenal description. Rationally, this situation has caused its relegation to "not being necessary" to rational-empirical epistemology and ontology. [footnote: since "phenomenal" can have the connotation of sense-apprehension rather than thing in itself, and empirical can imply acceptance on uncritical observation, I refer 'rational-empirical' to imply criticality via criteria of truth or correctness.]

Wholeness must resolve itself as both numinous and immanent, ultimately to the entire expression of the universe if "parts" are seen as "exegesis" to Wholeness.

IVB. EMERGENCE OR THE GENERATIVE LEVEL, THE DYNAMIC PRINCIPLE:
The above discussion of wholeness still admits to another key division. As numen, Wholeness may be talked about as Absolute, beyond all attributes, or as with attribute, qualified -- here, by a power or Dynamic Principle. These terms are loosely taken from Advaita Vedanta. The relation between the two terms is that the second, "with attribute; power of" is more immediate to the roots of the phenomenal/physical. It is the Dynamic Principle of expressibility. "In the Beginning was the Word,... all things were made through him and without him was made nothing that was made.." This power of the Absolute resides beyond time and space. It may be possible to sense the level implied here by noting pair concepts from various traditions;

Tradition	Absolute	Dynamic Principle of^^
Hindu	Brahman	Shakti
Mahayana Buddhism	Asamskrita Thathata or Shunyata	Shunyata
	Shunyata	Dharmadhatu
Judaism	En-Sof	Sefirot
Christianity		
gospel of John (Meister Eckhart)	God (the Father) Gottheit	Word/the Son/holy spirit God
physics	pure symmetry	breaking of
yin-yang	>>circle<<*	>>S<<*

^^ = here we are abstracting the Power Principle from the product of its power, an abstraction which does not fit fully into Buddhism.
* = see comments on yin-yang symbol below.

In John's Gospel we may also see other important associations to this level. "....And the Word became flesh... No one has ever seen God. The only Son, who is in the bosom of God, he has made Him known." While the Word, the Dynamic Principle is numinal, its product is both the phenomenal/physical --flesh-- and the pointing to the Absolute -- "has made Him known." It is the role of Maya in Hinduism. And it is analogous to the entire text here, and to words in general -- they arise out of the expressive power of meaning, and once formed, both point to and hide what they point to.

In the development of Paradoxical Wholeness, it is at this level of Emergence that distinction and dualism is first hinted at, but not yet formed. Therefore, we can also refer to this level as "generative". A new term, **Noton****, will be reserved for Wholeness without attribute.

[** = Huston Smith sees this use of "Noton" as his use of "Monism"]

NOTON

[Noton < Gr, noton, the back; the root of "noto", a combining form meaning the back: also before a vowel, not-]. Here we may take "back" as "back of" "transcendent", that is, if Noton is taken as a noun standing alone, it points to Wholeness without attribute. As a prefix to any logical distinction (not just a vowel) noto- will be read "not-", a negation as discussed under the section on Wholeness.

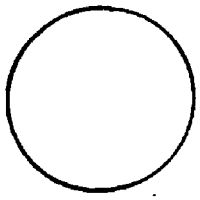
IVC. DUALISM AND DISTINCTION:

The distinction level is that of fully formed distinction. Dualism is binary distinction. Distinction, as we will consider it, is not simply object resolution -- that is of fully formed objects, e.g. "apple" from "pear" -- but also distinctions, such as involving superposition, admitted by logic in a broader form.

IVD. THE YIN-YANG:

Elements in the Tao symbol (yin-yang) are incorporated in the wholeness model, not arbitrarily, but because the tao symbol offers succinct expression of elements pertinent to "paradoxical wholeness". Aspects of Paradoxical Wholeness, to be developed, may be somewhat more intuitively followed by considering the yin-yang symbol as an "ideogram".

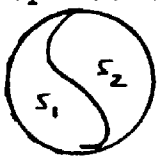
The Tao symbol includes:
1) an explicit designation of indivisible wholeness with the attachment that the designated wholeness is not The Wholeness that is designated (that is the designation points to, but cannot map to Wholeness).



2) an "emergence" or "distinction generator" level which may be affectionately called a "pregnant zero." This appears as the "S" line.

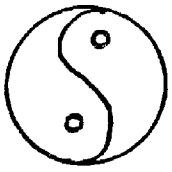
(It is this level which is at that of Shakti in our table)

It is important to note that in our model "S" will be taken as ultimately giving rise to spaces S1 and S2.



S1 and S2 are conceptually simultaneous to, but not identical to, the characterizing property of S itself. That is, the distinction generator and its logical descriptive level is not to be confused with the resultant dual logical spaces which are "simultaneous to S."

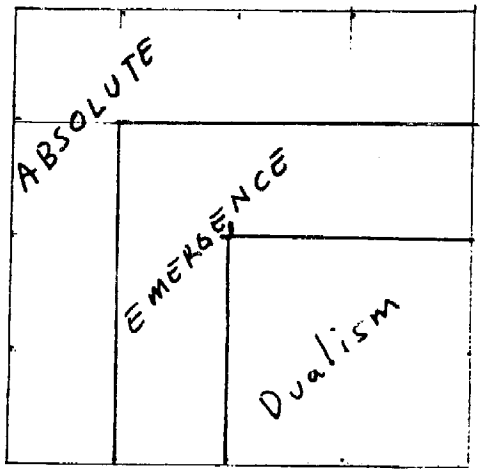
3) The interpenetration of S1-S2, i.e. S1 as a "kernel" within S2 and S2 kernel within S1. This will be related the formal identity which maintains either distinction S1 or S2.



V. THE MATRIX MODEL

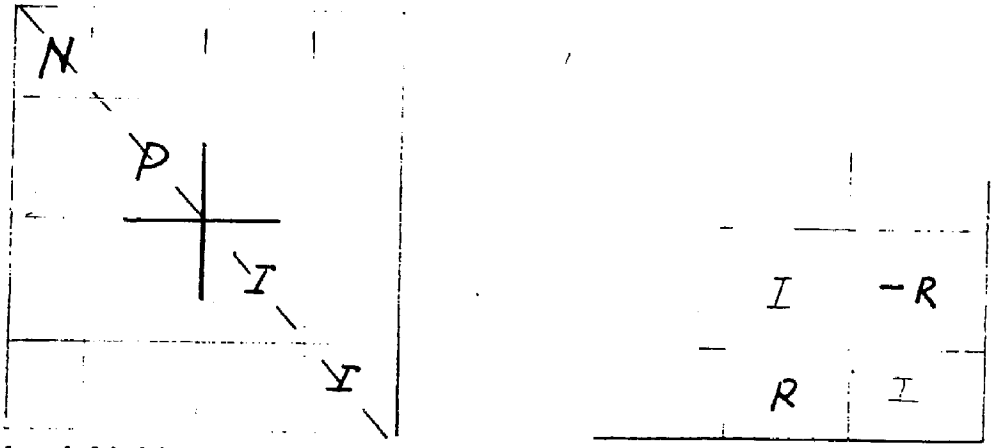
In the Introduction we sketched the architecture of the logic I seek to define by an image of a "flower" which extends from, and opens from the Unity of a single "point" to a full petalling of distinctions which are distinct yet inseparable from the Unity. The discussion of the yin-yang symbol sketches a similar "opening" of spaces S1 and S2 from an emergent level S.

In the formal development, these ideas are cast in the form of a matrix to which formal rules may be applied. The "Wholeness Matrix" is arranged as sketched here. For example, "expressed Wholeness" is represented by the entire matrix and the "Transcendent Absolute" by the top-left-most term position (the position and its "wings" are marked by "Absolute" in the sketch).



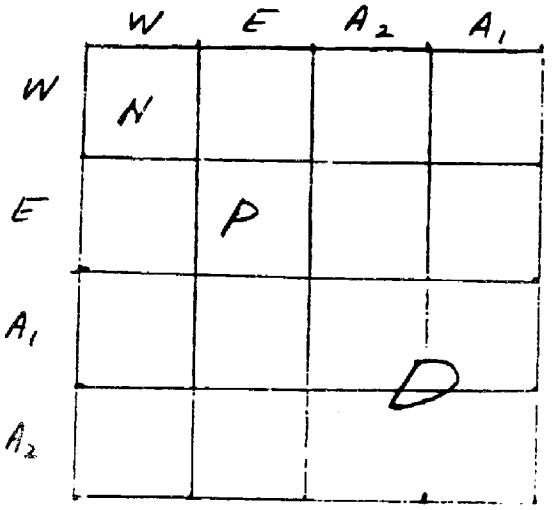
In the left sketch below, the diagonal elements represent not fully different terms, but "re-expression" of a single principle or identity element. For example, if N, below, denotes the transcendent absolute, then its expressive power is denoted P here. "P" was suggested to me by M. Stevens, from the Greek *prosopon* (face*), the hermetic cover of the Absolute. [* = "If you have seen me you have seen my Father: the Face of the Father, After Gospel of John. Also *Mahamaya* which plays a similar role in Vedanta. SEE INSERT PAGE FOLLOWNG THIS PAGE.]

At the level of Dualism, the diagonal elements are, again, "the" identity element, but here expressed as the identity elements of the dualistic distinction pair (R,-R)



The second and third insert page following here are from a set of more technical notes, but hopefully they (especially the third page) will give a sense of this architecture and the fit of world views within the architecture

We recapitulate the wholeness matrix as introduced in chapter 6.



$= W_t$

where we have changed our notation (following a suggestion by Richard Stevens) and replaced the symbol "E" as a fiducial element within W_t by "P" (Prosopon = Gr. face). This change serves a number of associations. Prosopopeia can be taken to denote the face of what is hermetic behind the face, echoing maya and mahamaya as we introduced these terms in chapter 11.

For example, in rhetoric, the hermetic may mean imaginary, inanimate, absent, etc; and Prosopopeia imply personification (of an inanimate) or representation of an imaginary or "absent being" as speaking or acting. Thus the face is also the phenomenal face of occulted power, such as the face of the Father in the Gospel of John: 'If you have seen Me you have seen the Father.'

As before, N denotes Noton (attributeless wholeness) and $D = P_X$ ($\equiv E_R$), the level of duals. We now consider

6 CHAPTER. MATRIX EXPRESSION

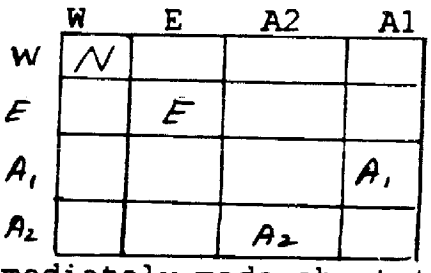
In this chapter I will begin the more formal description of the model, expressed as a matrix. The matrix will incorporate properties of transvolved Wholeness discussed in the preceding chapters, re-introduced more rigorously. To limit the amount of new abstraction, some properties of the matrix will not be justified until they can be argued in some detail in later chapters. Nevertheless, it is hoped that the overall properties of the matrix expression will be clear.

The matrix formalism may be first pictured as an "unfolding" of Wholeness. Unfolded - Wholeness, Emergence, and Dualism may be viewed either as hierarchical levels or as "transvolution" of transcendent Wholeness (Wt) itself. This is sketched here. The entire matrix is denoted by Wt.

Wholeness (W)

Emergence (E)

Dualism (A1,A2)



Three comments need to be immediately made about the matrix above. First, formal meanings will be assigned later to the squares which have been left blank here.

Second, the element "N" denoting Noton" (Wholeness without attribute) "preserves a name- space" for That beyond all concepts. Since making any statement requires "cuts" using conceptual or semantic elements, the matrix descriptions is limited or biased. Indeed, Every statement of wholeness, being a rationalization of wholeness, will a priori, be limited. That any statement can only be made from the standpoint of distinction, of finitude, will be formalized in the matrix expression.

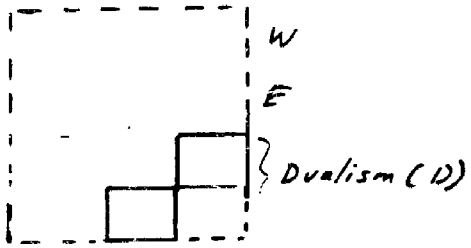
In regard to this point, it is important to reemphasize that Wholeness is immanent and transcendent at once. That is to say, any logical statement is a statement WITHIN the whole. The entire form must be able to be "readable" as expression of Wholeness itself. This will be meet by simultaneous inclusion of W as enveloping the entire matrix and W being a single distinguished term (N) in the matrix. In the matrix notation, then, one has wholeness as the total matrix and as a single distinguished element.

Third, the labeled elements in the matrix are the intersections of the corresponding rows and column labels. For example A1 at the intersection of the A1 row and column. This can be taken for now, just as a labeling process, but later will be stated as a substitution

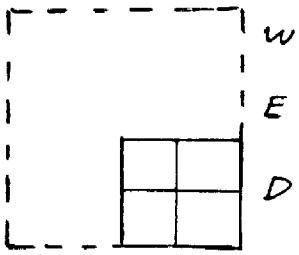
into the first axiom of distinction of G. Spencer-Brown (GS-B).

Before we proceed, here are sketches to show how different simplified world may appear representable within the matrix.

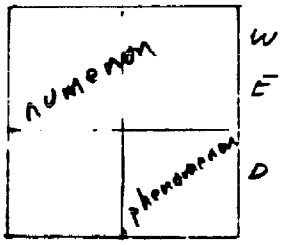
"common sense" = object dualism



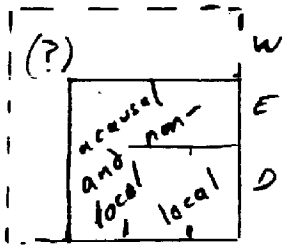
classical (causal) space-time physics
(related objects)



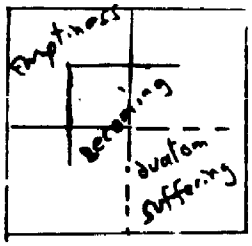
numenon/phenomenon



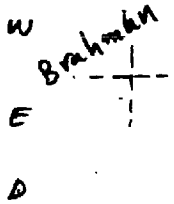
modern (acausal) physics ⟶

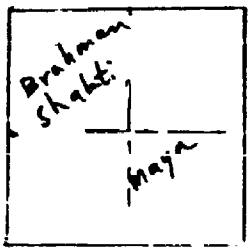


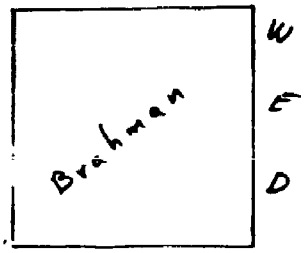
Teravada Buddhism
(Becoming)



Advaita Vedanta
(non-dual)







VI. BRIEF DESCRIPTION OF FORMAL LOGIC

How are the logical properties within the architecture we have just sketched to be formalized? An ability to carry out a formalization is necessary for three purposes:
(1) to demonstrate that there are relations which allow one to make a logical equivalences of aspects of religious cosmologies and of such concepts as emergence.
(2) to be able to test the logic by fitting to formal logical architectures as those in math and physics.
(3) to give the architecture the strength to be "predictive" and to lead to postulates of relation.

It is beyond this introductory paper to present these developments, But I will sketch parts of the effort and present a few of the resulting forms to illustrate the apparent viability of the approach.

VIA. DISTINCTION and PROPOSITIONAL LOGIC

A formalism for the logic of distinctions is developed from the work of B. Spencer Brown (Laws of Form). I hope to present here a good sense of his non-technical commentaries on this own developments, for he was well aware of the context of the cosmological context of the logic of distinctions. Secondly, his formalism is the king-pin my own developments.

The calculus of GS-B is that of form. Building from two axioms, and a single symbol, he derives the basic ground of binary and symbolic logic within an algebra. In its primitiveness, that is, in its laws of operation, results can be interpreted as a truth logic, but the forms are not derived from it. That is, the calculating "forms are thus not only precursors of existence, they are also precursors of truth." (p101)

In his book "LAWS OF FORM," the mathematician G.Spencer-Brown (GS-B) writes:

> ...this is a text book of mathematics, not of logic or philosophy,although both logic and philosophy can of course benefit from its application... (pxi)
>
> "The theme of this book is that a universe comes into being when a space is severed or taken apart... By tracing the way we represent such a severance, we can begin to reconstruct, with an accuracy and coverage that appears almost uncanny, the basic forms underlining linguistic,mathematical, physical, and biological science, and can begin to see how the familiar laws of our own experience follow inexorably from the original act of severance." (pxxiv)
>
> One of the motives prompting the furtherance of the present work was the hope of bringing together the investigations of the inner structure of our knowledge of the structure of the universe, as expressed in the mathematical sciences, and the investigations of its outer structure, as expressed in the physical sciences. Here the work... seems to have led to the realization of an ultimate boundary of physical knowledge in the form of the media through which we perceive it..[and it follows that] an equally extended study of this inner world will reveal, in turn, the facts first met with in the world outside: for what we approach, in either case, from one side or the other, is the common boundary between them.... My conscious intention in writing this essay was the elucidation of an indicative calculus, and its latent potential, becoming manifest only when the realization of this intention was already well advanced, took me by surprise." (p xxv, xxvi)

It seems hard to find an acceptable answer to the question of how or why the world conceives a desire, and discovers an ability, to see itself, and appears to suffer the process. That it does so is sometimes called the original mystery. Perhaps, in view of the form in which we presently take ourselves to exist, the mystery arises from our insistence of framing a question where there is, in reality, nothing to question.... In this sense, in respect of its own information, the universe must expand to escape the telescopes through which we, who are it, are trying to capture it, which is us. The snake eats itself, the dog chases its tail. (p 105 - 106)

It is, I am afraid, the intellectual block which most of us come up against at the points where, *to experience the world clearly, we must abandon existence to truth, truth to indication, and indication to form, and form to void*, that has so held up the development of logic and its mathematics. (p101; italics by NM).

GS-B's notation is both extremely simple and powerful although not fully unambiguous without auxiliary specifications which can be made for various classes of problems.

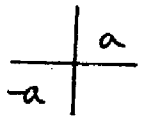
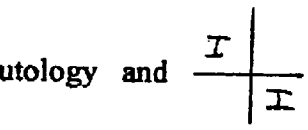
The first result for us, is that because groups of semantic statements can be reduced to single logical forms, propositional logic can be expressed as a matrix calculus. We may form a matrix by writing and statements as rows of terms and or statements as columns.

a or b	a and b
a	a b
b	

along with the transformation rule $\begin{matrix} a \\ b \end{matrix} = \overline{\not{a}\ \not{b}}$ where the slashes are negations.

Theorems of logic can be proven in the row-column form. Although this row-column form is not to be confused with the wholeness matrix, we can see briefly how a mutual exclusionary (dualistic) distinction can occur in the Dualistic portion of the wholeness matrix; a derivation can be given for splitting a tautology (I) so that

$$I \dashrightarrow a$$
$$\downarrow$$
$$\not{a}$$

That is,  expresses an "open" tautology and  expresses a "closed" tautology.

VIA.1 MULTI-VALUE LOGICS

It is significant to note that the logic form developed here can be extended still building on the notation of GS-B. In extension, one is able to transcribe the three-value logic of the "objective language" of Hans Reichenbach (Philosophical Foundations of Quantum Mechanics). His logic builds on three values: True, False, and Indeterminate and contains truth tables for three forms of negation, three of implication, and two of equivalence. From these he is able to construct a logical statement with the properties of a quantum mechanical uncertainty principle. Making the transcription demonstrates that GS-B's approach is not limited to binary logic.

VIB.1 ARITHMETIC, MEASURE and TAUTOLOGY

Arithmetic differs from the sentential logic just discussed in that it must admit counting, scale, and measure. This introduces another level of formalism -- a symbolic way to represent measure. The few calculational notes in this section are simply to provide a sense of the progression from sentential concerns to quantity and that the formalism can be so extended.

It is possible to put the arithmetic in the form of matrix-like expressions in which rows are additive statements and columns are multiplication statements. Doing this highlights the constraints in moving between propositional or truth logic and statements of quantification. In addition to count and measure, the rules of arithmetic negation place constraints on the relationship of terms if they are being compared under semantic interpretations, such as "to measure" signifies "to know." An important result is that in the formal development we are moved to writing a measure (or a ratio) in terms of what I have naively called "Whiteheadian" numbers. For example, in a number such as 4/5, both the numerator and denominator signify a "counter" yielding the "4" and the "5". The measure "4 in units of 5" will always contain (at least implicitly) the tautology of the 'counter measuring the counter'. It is suggestive to call the this self-cancelling part of the expression the "subjective" part of the number. In the notation here, 4/5 may be represented by

$$\begin{array}{c|c} m & m \\ \hline 4 & 5 \end{array}$$ where m represents the counter.

A number is an informed space. It may correct to say a number implies an informed world. (i.e. The dualistic level of the wholeness matrix is "self-informed")

I close this section with a brief proof of a theorem from knot theory. Since it is presented without comment, it may appear here simply more as an art form.

Knot Theory, an example of a calculation:
In "The Sciences", May/June 1997, Dana Mackenzie offers an article on knot theory, which caught my attention because the theory contains rules reminiscent of what I expect to encounter in exploring the complex number i. In addition, she notes "Connes has shown that a slight elaboration of the two-point space yields a model of the universe which makes the same predications as the physical theory that unifies the electromagnetic force with the weak force resonsible for radioactive decay." -- we will see a similar situation in GS-B.

The two rules are (for the geometry offered in the article): a "twist" is + 1 (and so a direct sequence of N twists = N), and a "turn" is the negative inverse of the immediately prior value (e.g. -1/N).

For our example, suppose the value of a turn/twist history is Q, then a subsequent history of

Q + twist + turn + twist + turn + twist + turn =Q

appears in EA as

$$\boxed{\boxed{\boxed{Q,L},L},L} = Q$$

This may be proved as follows.

$$\boxed{Q,L},L$$

$$= 1\,\boxed{Q,L}L = \overline{L}\,\boxed{Q,L},L$$

$$= \overline{L}\,\boxed{Q,L}\,,\,(Q,L\,\boxed{Q,L})$$

$$= (\overline{L},Q,L)\,\boxed{Q,L}$$

$$= Q\,\boxed{Q,L}$$

So $\boxed{\boxed{\boxed{Q,L},L},L} = \boxed{Q\,\boxed{Q,L},L}$

$$\boxed{Q\,\boxed{Q,L}},L = \overline{Q,L}\,\boxed{Q,L}$$

$$= \overline{Q\,Q},\overline{L\,Q},L$$

$$= \overline{L},\overline{L\,Q},L = \overline{L\,Q}$$

So $\boxed{\boxed{Q\,\boxed{Q,L}}L} = \boxed{\overline{L\,Q}}$

$$= Q$$

VIC. THE IMAGINARY NUMBER i

The knot problem shows the form in which the imaginary quantity i, enters our notion. It satisfies

$$i' = \boxed{i}$$

and has, it appears, an important role to play both in measure and in Emergence level of the wholeness matrix.

VIC. EMERGENCE

In order to not wander further into formalism, it is reasonable to stop now and address the logic of the emergence level. Because it is almost time to hand in this paper, this section is built from clippings from the my earlier writing. Therefore some terms and concepts are not defined here, but hopefully, the gist of the of the development indicates itself. The important conclusions are that the logic of the emergence level can be formalized as a pre-measurement logic, yet it is necessary "generative" level for distinction and measure. It appears that the form developed here has a strong fit to characteristics of Dirac's formalism for quantum mechanics.

In the clipped notes, Ex denotes the level of dualism, E and Emf signify The level of emergence.

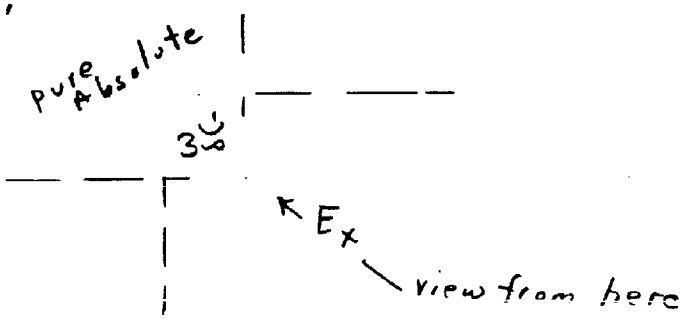
11-2: Emergence within Metaphysical Models of Reality

An example for conceptualizing the Emergence level may be to consider

(OM)

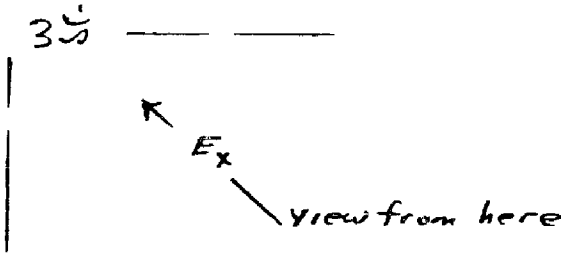
the sacred syllable which in Hinduism represents the Impersonal Absolute as well as the personal aspect of God; the logos. It represents the unmanifested word which produces all manifestation (Ramakrishna wordbook, p54).

We may view the sense of OM as an "active principle" which (viewing from Ex) may be conceptualized as expressing from/as an "Unqualified Root,"



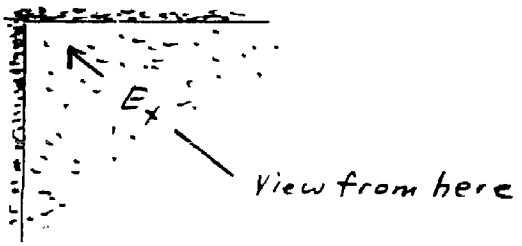
(We do not resolving pole terms (E <--> Emf) here.)

or Om may be taken as a Principle in itself,



In these sketches we have tried to transcribe some of the ways in which Om is depicted. We also see here relation to the concept of Maya. In the Advaita Vedantic philosophy, a recognition of maya and Mahamaya illustrates the sense of the emergence level and exvolution (Ex). Maya/Mahamaya veils Reality (the Unqualified) and projects in its place something which is not Real (Ex) -- this is maya;

Maya as a "boundary layer" to the "Unqualified" approached from the side of distinction.



Maya can be taken as the sum total of space/time/causation. The word has as its origin the same root as "measure." We may also see this form as the active principle, Shakti, taken as the aspect Prakriti --i.e. Nature as a cosmic principle and the root generation of informed distinction (Ex).

Mahamaya, ignorance is vanquished through her grace, as and the Self becomes known as Absolute or Real.

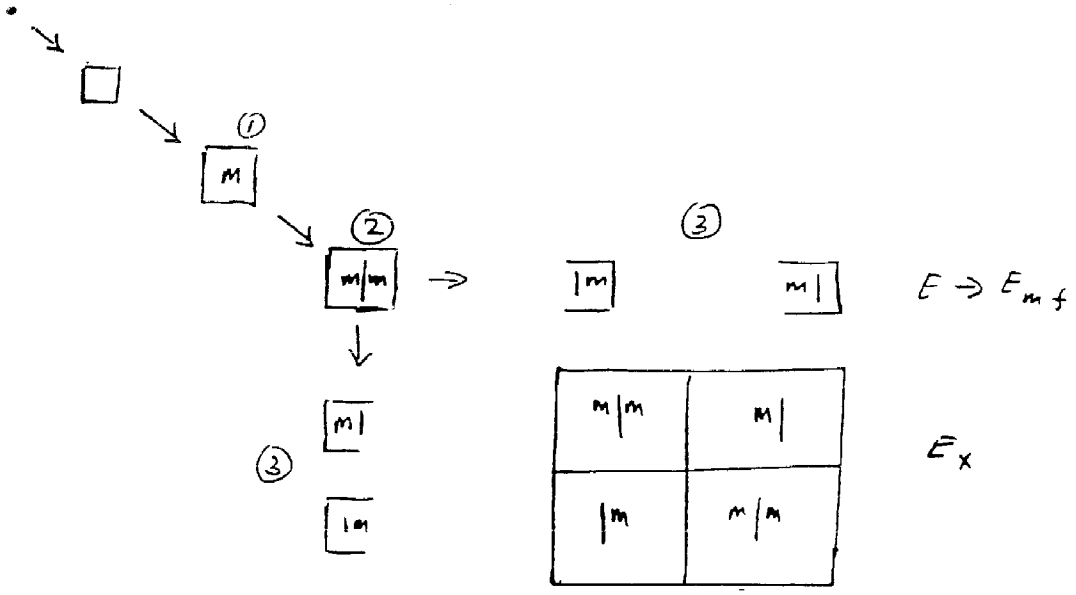
In Buddhism, Ex appears to correspond to the level of the concept of pratitya-summutpada, and E to that of Sunyata. That is, E with/as Emf is at the level of "root" to the phenomenological level of "interdependent arising."

Story 1)
We may sketch a developing "opening" of E by a process which we may call "morulic," from *morula* or the first group of still undifferentiated cells formed by cell division without growth -- the first stage of embryo formation.

For story-like suggestion in the sketch below we represent the Pure Absolute by a dot such as the dot in

ॐ

which in Mahayana Buddhism is taken to designate >Shambala Dict<

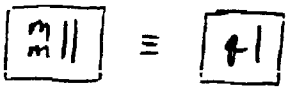


① name of object which is to become

② morula : duplication of name as tautology

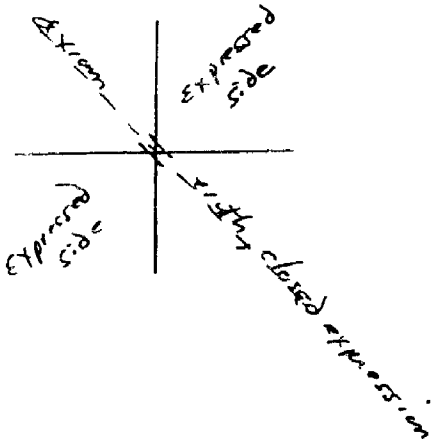
③ emergent separation of "side to name" w.r.t. "space to become"

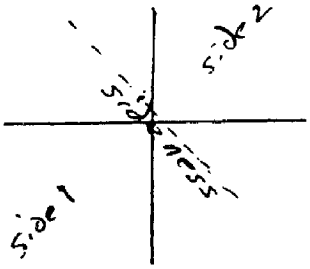
④ E_x level is  by the use of the calling axion (GGS-B) or what I've started to call "congruence". Alternately we could write

 ≡ in E_x denoting a "side"

in Dualism (Ex):

We can call m|m (the diagonal term) an axiomatic or tautological form. And in Ex, m|, |m become the resolved or distinguished (sides) of the tautology. The development at this level is consistent to what we have a priori assumed for Ex earlier.





as an example
akin a mobius strip

VII. TRANSCENDENTAL UNITY

We have taken Wholeness has having two description levels, as the whole matrix, and as the term Noton. The first is the level of "manifestation", and second, the level of notating the Absolute. "Immanence" is a consequence of the identity diagonal of the matrix. Here we consider Noton.

If we accept the logical structure of emergence as sketched in the prior subsection, then Transcendental Unity, as designated by "Noton" in part V, becomes a necessary logical category. In the preceding subsection, we sketched a cartoon "opening" of the emergence to yield the dualistic level. Although not discussed here, the formal process involves logical "doublings" or "foldings." It becomes a processes we may call a "condensation" to phenomena (measured or in-formed distinctions, per Section VIB.) We return to Noton by "unfolding" what we have just folded. We find that the level Noton is logically implied but not reachable, that it is not self-consistently named. This level can only become pointed to by such paradoxical statements as we give at the close of this section. It appears this conclusion, in the matrix formalism, is supported by what appears to be an inherent limit in the classical language of distinction when applied to the tautological form in GS-B's notation. Noton is a "logical background," but is indicated to be more than a conceptual background only. As, say, the New Physics points to a phenomeno-logical root of existence, the "Still" or "Absolute" may be such a state/nonstate to which we give such description as we can.

The structural needs of Wholeness, as we will address them here, are better portrayed in various forms within Faith traditions than within even the New Physics. And so we close this section with a number of partial texts:

Taoism
>The Tao that can be told is not the eternal tao
The name that can be named is not the eternal name
The nameless is the beginning of heaven and earth
The named is the mother of ten thousand things. - Lao Tzu, *Tao Te Ching*

Christianity
>If you have grasped it, it is not God - St. Anselm, *Monoogian*

Advaita Vedanta
> It is through your ignorance alone that the universe exists. In reality you are One. There is no individual self or Supreme Self other than you. Astavakra Samhita, XV.16. (translated by Swami Nityaswarupananda)

Mahayana Buddhism [or later, possible quotes from Ho-shan Wu-yin school]
> In the pure and deep ultimate silence, all creation is transcended:/ A sudden awakening to the original perfect fusion of self and dharmas. - from verse by Tripitaka Master Hua, *The Heart Sutra and Commentary*, p.48

Mahayana Buddhism
> The ways of [the Buddhas] are subtle, wonderful, and hard to comprehend; not thought, they are apart from every thought: those seeking them in seeing cannot attain them.....Their own nature basically is empty and it's still; non-dual it is, But it is also unending...They are not beginning, nor

middle, nor end; they are not expressible in words; they transcend the three periods of time; their characteristics are like empty space....The wise know intellect does not reach them. - *Flower Adornment Sutra: The Ten Grounds, Chapter 26, Part 1.*, Commentary by Tripitaka master Hua

Mahayana Buddhism
> Originally Bodhi has no tree,
The bright mirror has no stand.
Originally there is not a single thing:
Where can the dust alight?
(translated by Bhikhuni Heng Yin from Hsuan Hua, Tripitaka Master, *The Sixth Patriarch's Dharma Jewel Platform Sutra with the Commentary of Tripitaka Master Hua* - p97)

>>>>>Islam = Tawhid/ see attached page for contextual

Advaita Vedanta
> ...is another unmanifest state of being higher than the primeval unmanifest, which, when all beings perish, does not perish. This unmanifest is the imperishable, thus it is is said. They call it the supreme goal, attaining which, they do not return. This is My supreme dwelling place. *The Bhagavad Gita* Chp VIII, 20/21 (translated by Winthrop Sargeant)

Kabbal (Judiasm) [to be replaced; ref Steven Joseph]
> Ayin means *No-thing*. Ayin is beyond existence, separate from any-thing. Ayin is Absolute Nothing. Ayin is not above or below. Neither is Ayin still or in motion. There is nowhere Ayin is, for Ayin is not. Ayin is soundless, but neither is it silence. Nor is Ayin a void -- and yet out of the zero of Ayin's no-thingness comes the one of En Sof. En Sof means the endless. As the One to the Zero of Ayin, En Sof is the Absolute All to Ayin's Absolute Nothing. Both nothing and All are the same. Beyond the titles of Ayin and En Sof no attributes are given to the Absolute. God is God and there is nothing to compare with God. - Z'evben Shimon Halevi, *A Kabbalistic Universe*

Advaita Vedanta
> Brahman is other than the universe. There exists nothing that is not Brahman. If any object other than Brahman appears to exist, it is unreal like a mirage. Sri Sankaracarya, *Self-Knowlege*, (63)(translated by Swami Nikhilananda)

Christianity
> Everything that is in the Godhead is one, and of that there is nothing to be said. God works, the Godhead does no work: There is nothing for it to do, there is no activity in it. It never peeped at any work. God and Godhead are distinquished by working and not working." - Mesiter Eckhart, from Walshe, *Meister Eckhart: Sermons an Treatisies* (82), Josef Qeuint, ed., Meister Eckart: Deutsche Predigtin and Traktate (8) appearing in Woods, Richard, *Eckart's Way*, p47

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TAWḤĪD (A.), infinitive II of *w-ḥ-d*, means literally "making one" or "asserting oneness" (Lane, p. 2927a). In consequence, it is applied theologically to the oneness (*waḥdāniya*, *tawaḥḥud*) of Allāh in all its meanings. The word does not occur in the Ḳur'ān, which has no verbal form from this root nor from the kindred *'-ḥ-d*, but in the *Lisān* (iv. 464, 26 to 465, 4 from below) there is an elaborate philological statement of the usages of the different forms from these roots as applied to Allāh and to men. Technically "the science of *tawḥīd* and of the Qualities" (*'ilm al-tawḥīd wa 'l-ṣifāt*) is a synonym for "the science of *kalām*" [see article KALĀM] and is the basis of all the articles of the belief of Islām (Introduction by Taftazānī to the *'Aḳā'id* of Nasafī, ed. Cairo 1321, p. 4 *sq.* and the marginal commentaries thereon, *Dict. of techn. terms*, p. 22). In this definition the Mu'tazilites would exclude the qualities and make the basis *tawḥīd* alone. But unity is far from being a simple idea; it may be internal or external, it may mean that there is no other God except Allāh, who has no partner (*sharīk*): it may mean that Allāh is a Oneness in himself; it may mean that he is the only being with real or absolute existence (*al-ḥaḳḳ*), all other beings having merely a contingent existence; it may even be developed into a pantheistic assertion that Allāh is All. Again, knowledge of this unity may be reached by the methods of systematic theology (*'ilm*) or by religious experience (*ma'rifa*, *mushāhada*); and the latter, again, may be pure contemplation or philosophical speculation. In consequence, *tawḥīd* may mean simply "There is no god but Allāh" or it may cover a pantheistic position. There is a good statement of these developments in *Dict. of techn. terms*, p. 1468—1470; cf. also, p. 1463-1468.

(D. B. MACDONALD)

ref. Snjezana Akpinar

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VII. CONCLUDING COMMENTS

This paper is not about drawing conclusions. Rather, I close by noting two research directions:

(1) I am seeking to fit formalization from this model to key formalized concepts in physics. Physics gives us very strongly defined concepts -- "strong" in that they are rigorous at the level of measure and mathematical description, but (and importantly) they are still very open philosophically. If such a unity-distinction model as I am emphasizing here, which derives from the structures of certain religious traditions, can fit the formal architecture of physics, then we may broaden the basis of dialogue.

(2) I believe the approach sketched here provides a reasonable frame for studying the logical descriptive levels of various religions -- both as to levels within a single faith, and in comparative religions. For example, in statements of Jesus as Son of God, and as Him dwelling among us, and as the Word of God, and in statements of God and Godhead, and of God of the People, one sees several logical levels of description. Such structuring also appear in other religions.

One should also be able to compare similarities and differences of outward and inward directed religious philosophies and practices from a similar basis.

To explore these two ressearch directions would be a long term pleasure.