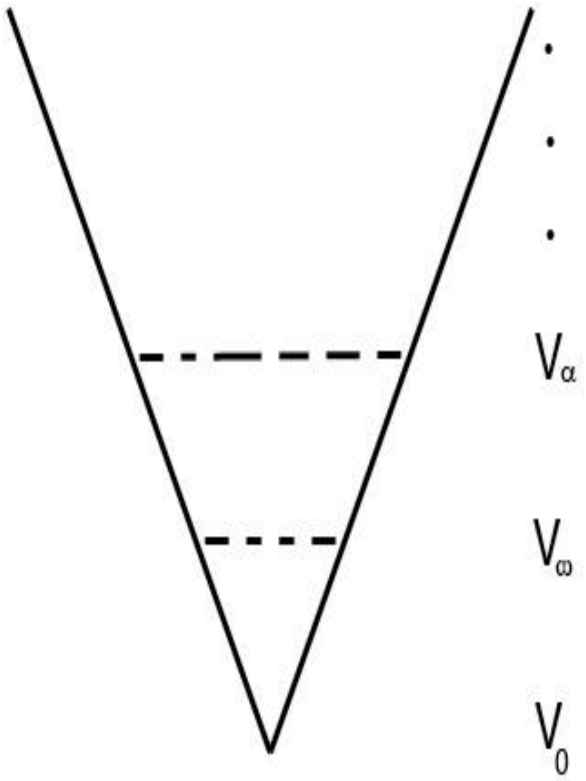
Undertanding the Manifest Universe in Terms of Absolute Mathematical Structures

Mathematical Representation of Dynamics of Wholeness

Maharishi Vedic Science	Set Theory
• Wholeness	• V, the universe of sets
• Move of wholeness within itself	• j : V -> V
• Wholeness unchanged by the transformation	• j is an *elementary* embedding
• Dynamics of wholeness present at every point in creation	• The restriction of j to any set is itself a (set) function in the universe
• Collapse of Infinity to a Point, imbued with infinite dynamism – collapse of A to K	• The critical point κ arises as the first point moved by j, imbued with the properties of wholeness of V, including all large cardinal properties
• Expansion of Point to Infinity – K expands to Veda to Vishva	• Interaction between j and κ gives rise to a *strong blueprint* for all sets in the universe: $(\ell, \ell^{op}, \kappa, \mathcal{E})$.

The Wholeness V



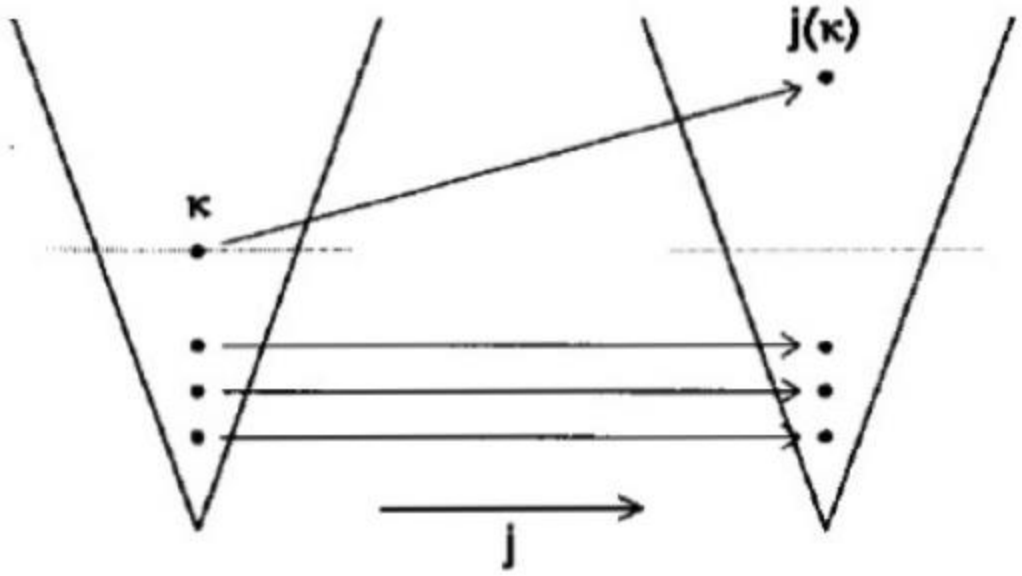
Mathematics Point of View

* Every mathematical object can be represented as a set
* Every set is in V

MVS Point of View

* V is container of all sets but is not itself a set (hence "unmanifest")
* V contains all knowledge about how to create itself and contains all the laws the govern unfoldment of sets ("home of all the laws of knowledge", "home of all knowledge", "self-sufficient")

The Transformation j: V -> V



1. *Transforms but nothing is changed*. j transforms V to itself and yet V is not changed by the transformation: every property of sets is preserved by j because it is an *elementary embedding*
2. *From silence to a point of infinite dynamism*. At first, j is the silent identity function. Then a first set is stirred. This first set, denoted κ, contains within it the full power of manifestation of all sets, and all exotic large cardinals.

The Blueprint (ℓ , ℓ^{op} , κ, $\mathcal{F}$)

1. $\ell : V_\kappa \rightarrow V_\kappa$
   For each set X in the universe, there is a "decoder" embedding i in $\mathcal{F}$ such that
   $$X = i(\ell)(\kappa)$$

2. $\ell^{op} : V_\kappa \rightarrow V_\kappa$
   For each set X in the universe, there is a "decoder" embedding i in $\mathcal{F}$ such that
   $$\kappa = i(\ell)(X)$$

3. For almost all ordinals $\alpha < \kappa$, the restriction of ℓ to V_α produces essentially the same blueprint of the universe

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Critical Point κ of j Can Declare "I Am Wholeness"

1. From κ all sets arise
2. The stage V_κ it itself a universe that knows all there is to know about V (because V_κ is an *elementary submodel* of V)
3. The universe V_κ is encoded entirely in the point κ: There is an isomorphic universe (κ, E) that also knows all there is to know about V.

The Critical Sequence of j

1. Repeated application of j to its critical point κ produces the *critical sequence* of j:

   $\mathbf{S} = \{\kappa, j(\kappa), j(j(\kappa)), \ldots\}$

2. Each element of the critical sequence is indistinguishable from κ itself. Each can declare "I am Wholeness".

3. Using the technique of *Mostowski collapse*, **S** is transformed into the natural numbers:

   $\{\kappa, j(\kappa), j(j(\kappa)), \ldots\} \Rightarrow \{0, 1, 2, 3, \ldots\}$

Maharishi's Absolute Number and the Critical Sequence of j

1. Maharishi's Absolute Number is the dynamics of wholeness which constitutes the ultimate nature of each natural number

2. To restore the dignity of each natural number as wholeness, Maharishi drew a circle around each natural number to indicate that, while each number is an individual expression, its primary reality is wholeness

3. The critical sequence **S** = $\{\kappa, j(\kappa), j(j(\kappa)), \ldots\}$, as a blueprint for the natural numbers, can now be seen as a mathematical expression of this vision – each natural number is now seen in terms of its Absolute nature.

Unmanifest Dynamics Underlying Unfoldment of the Universe

The universe has its reality in unmanifest dynamcis

The notion of time comes into being with the phenomenon of sequence arising in the self-referral state of Samhita of Rishi, Devata, and Chhandas—the unmanifestcontinuum. The holistic value of Natural Law—Samhita—has within it the notion oftime and space in the realization of itself—Rishi, Devata, Chhandas—the realization of the three-in-one structure of its unified nature

-- Maharishi

Question: Can the mathematics for describing the physical universe be established in wholeness in the same way the natural numbers can?

Outline

1. Starting point is the class **S** = $\{\kappa, j(\kappa), j(j(\kappa)), \ldots\}$ of "absolute" natural numbers, obtained as the critical sequence of a single WA-embedding j: V->V with critical point κ

2. Introduce an *application* operation $\cdot$ that allows j to interact with itself in all possible ways: $j \cdot j$, $j \cdot (j \cdot j)$, $(j \cdot j) \cdot j$, $(j \cdot j) \cdot (j \cdot j)$ etc.

3. Each such combination is another WA embedding.

4. The collection of all such combinations is denoted A_j and the collection of all critical point of these combinations is dentoed $crit(A_j)$.

5. $crit(A_j)$ includes the critical sequence of j, but has many other elements as well.

(continued)

6. Laver showed we can enumerate crit(A_j) with a unique increasing function e: ω -> crit(A_j)

7. The collection A_j admits a natural metric d: d(i,k) = 1/(m+1) where m is the least natural number such that i(e(m)) ≠ k(e(m)).

8. Under the induced topology, A_j is *dense in itself.*

9. Obtain the *completion* of $\bar{A}_j$ by embedding A_j into the space ω^ω of all functions $\omega \to \omega$ with metric defined by $\rho(f,g) = 1/(m+1)$, where m is least such that f(m) ≠ g(m), and then letting $\bar{A}_j$ be the "closure "of A_j. The space ω^ω is topologically equivalent to the space of irrationals on (0,1).

10. One shows that $\bar{A}_j$ is a perfect Polish space with a natural nontrivial Borel measure, making it a natural candidate for building a Hilbert space

(continued)

As a first step toward defining the Hilbert space $\mathscr{L}^2(\bar{A}_j, \mu)$, we define:

$$V = \{f : \bar{A}_j \to \mathbb{C} \mid |f|^2 \text{ is } \mu\text{-integrable over } \bar{A}_j\},$$

where $\mathbb{C}$ is the set of complex numbers. Defining addition and scalar multiplication pointwise turns V into a vector space. A quasi-inner product can be defined by

$$(*) \qquad \langle f_1, f_2 \rangle = \int_{\bar{A}_j} f_1 f_2^* \, d\mu.$$

As usual in this construction, a property that is needed, but that we do not have, is

$$\langle f, f \rangle = 0 \Leftrightarrow f = 0.$$

This difficulty is corrected by introducing an equivalence relation $\approx$ on V by

$$f_1 \approx f_2 \quad \text{iff} \quad |f_1 - f_2| = 0 \ (\mu\text{-a.e.}) \text{ on } \bar{A}_j.$$

(continued)

For each $f \in V$, let $[f]$ denote the $\approx$-equivalence class containing f. Define $\bar{V} = \{[f] \mid f \in V\}$. One shows that the inner product computation $(*)$ does not depend on the choice of representatives, and that addition and scalar multiplication are well-defined. Now, we have properly defined $\mathscr{L}^2(\bar{A}_j, \mu)$ by the triple $\bar{V}, \mu$ and this inner product defined on equivalence classes. Because $\bar{A}_j$ is a Polish space, it follows that $\mathscr{L}^2(\bar{A}_j, \mu)$ is a separable Hilbert space. We have now the mathematical setting for performing a quantum-mechanical analysis of some system behaving within $\bar{A}_j$.

(continued)

- Hilbert space is the mathematical context for understanding quantum mechanics, which in turn provides a profound insight into the structure of the physical universe
- This particular Hilbert space is "made" of "absolute" entities – it consists of all square integrable maps from embeddings (and their limits) of wholeness into the complex plane.
- We have therefore an "absolute" version of Hilbert space, in the same spirit as our "absolute" version of the natural numbers.
- This shows how it is possible to build an applied mathematics founded on the dynamics of the Maharishi's Absolute Number