

THE INVERTED PYRAMID AS THE IMMERSION OPERATOR ι : ANTIWORLD, POSITRONIC PHASE, AND REALITY DEACTUALIZATION

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ABSTRACT

Within the ODT OE (Observer-Dependent Theory of Everything) formalism, the inverted pyramid (apex-down) is interpreted as the geometric realization of the immersion operator $\iota : \mathcal{C} \rightarrow \mathcal{H}$ — the reverse phase of the self-observation cycle. It is shown that while the upright pyramid \blacktriangle realizes the observation operator $\hat{O} : \mathcal{H} \rightarrow \mathcal{C}$ (actualization), the inverted pyramid \blacktriangledown realizes immersion (deactualization) — the return of configurations to the field of potential states. Analogies with the positronic phase in particle physics (β^+ -decay) and the ODT OE concept of the Antiworld are established. The geometric union of upright and inverted pyramids ($\blacktriangle\blacktriangledown$) forms an octahedron — the minimal self-consistent structure of the complete cycle $\Phi = \iota \circ \hat{O}$. The mathematical necessity of the inverted component for closing the strange loop and the existence of the fixed point Ψ^* is demonstrated. An archaeological prediction is formulated: symmetric subterranean structures should exist beneath the foundations of major pyramids.

Keywords: ODT OE, inverted pyramid, immersion operator, deactualization, positronic phase, Antiworld, octahedron, strange loop, fixed point, spiral dynamics.

I. PROBLEM STATEMENT

Pyramids as architectural structures have been studied from the perspectives of geometry, history, and cultural studies. However, their deeper significance in the context of observer-dependent operator theory remains unclear. In the ODT OE formalism, the cycle of self-observation can be represented as a sequence of transformations: potential states \mathcal{H} are actualized into configurations \mathcal{C} through the observation operator \hat{O} , and then must return again through the immersion operator ι .

The upright pyramid (apex upward) intuitively corresponds to the process of actualization — ascent from the base (manifold of potential states) to the apex (unique actual state, act of observation). However, the complete cycle requires reverse motion: from actual to potential. This motion should be realized by the inverted pyramid.

The fundamental question is: *can the inverted pyramid serve as the geometric realization of*

the immersion operator $\iota : \mathcal{C} \rightarrow \mathcal{H}$, and what mathematical and physical consequences follow from this analogy?

II. TWO DIRECTIONS OF ACTION IN ODT OE

2.1. Forward action (actualization): $\hat{O} : \mathcal{H} \rightarrow \mathcal{C}$

The observation operator \hat{O} transforms the field of potential states \mathcal{H} (Hilbert space) into configurations of the actual world \mathcal{C} :

$$\hat{O} : \mathcal{H} \rightarrow \mathcal{C} \quad (\text{II.1})$$

This operator:

- narrows the manifold of possibilities to a single manifest state;
- fixes observable quantities;
- corresponds to the geometry of the upright pyramid (from base to apex).

2.2. Reverse action (immersion): $\iota : \mathcal{C} \rightarrow \mathcal{H}$

The immersion operator ι realizes the reverse process:

$$\iota : \mathcal{C} \rightarrow \mathcal{H} \quad (\text{II.2})$$

This operator:

- returns actual configurations to the field of potential states;
- increases the entropy of the observed system;
- corresponds to the geometry of the inverted pyramid (from apex into depth).

2.3. Complete cycle: $\Phi = \iota \circ \hat{O} : \mathcal{H} \rightarrow \mathcal{H}$

The composition of the two operators forms a closed cycle:

$$\Phi = \iota \circ \hat{O} : \mathcal{H} \rightarrow \mathcal{H} \quad (\text{II.3})$$

The fixed point of this cycle:

$$\Psi^* = \Phi(\Psi^*) = \iota(\hat{O}(\Psi^*)) \quad (\text{II.4})$$

is the central object of ODT OE and characterizes the state of complete self-consistency of the system.

III. THE INVERTED PYRAMID AS THE OPERATOR ι : $\mathcal{C} \rightarrow \mathcal{H}$

3.1. Geometric inversion of roles

Table 1 compares the main geometric and functional characteristics of upright and inverted pyramids.

Table 1: Upright and inverted pyramids in the ODTOE formalism

Element	Upright pyramid \blacktriangle	Inverted pyramid \blacktriangledown
Apex orientation	Upward	Downward
Base	Wide (manifold)	Narrow (singularity)
Apex	Point of actualization	Point of immersion
Direction of evolution	$\mathcal{H} \rightarrow \mathcal{C}$	$\mathcal{C} \rightarrow \mathcal{H}$
Operator	\hat{O} (observation)	ι (immersion)
Energy	Concentrates	Disperses
Entropy	Decreases	Increases
Physical correlate	β^- -decay (neutron \rightarrow proton)	β^+ -decay (positron)

3.2. Apex in the earth = immersion into the Antiworld

If the apex of the upright pyramid symbolizes the point of maximum actualization (an observer on a mountain peak seeing the entire world), then the apex of the inverted pyramid, directed into the depths of the earth, symbolizes *the point of maximum immersion* — entry into the ODTOE Antiworld.

In this interpretation:

- The base of the inverted pyramid corresponds to the surface (boundary of actual and potential worlds);
- The lateral faces of the pyramid — regions of gradual transition (hybrid spaces);
- The apex descending into the depths — singularity of immersion, analogous to a black hole in cosmology.

3.3. Formal notation of the immersion operator

An observed state R is actualized from a potential state Ψ through the observation operator:

$$R = \hat{O}(\Psi) \quad (\text{III.1})$$

Upon immersion, state R introduces a perturbation into the potential field, creating a new state Ψ' :

$$\Psi' = \iota(R) \quad (\text{III.2})$$

In general, $\Psi' \neq \Psi$, which reflects the irreversibility of the cycle and energy dissipation.

IV. FUNCTIONAL SIGNIFICANCE OF THE INVERTED PYRAMID

4.1. Deactualization and stochastic dynamics

The immersion process is described by the dynamical equation:

$$\frac{dC}{dt} = -\frac{\alpha}{I(C) + \varepsilon} \cdot \nabla U(C) + \eta(t) \quad (\text{IV.1})$$

where:

- C — configuration in the actual world;
- $U(C)$ — deactualization potential;
- $I(C)$ — information content of the configuration;
- $\eta(t)$ — stochastic noise (source of potentiality);
- α — coefficient of immersion intensity.

4.2. Increase in stochastic potential

In the process of immersion, the number of potential paths (stochastic potential) increases in accordance with the formula:

$$D(\eta) = D_0 \cdot (1 - S) \quad (\text{IV.2})$$

where S is the degree of structuredness of the configuration. As immersion proceeds, $S \rightarrow 0$ and $D(\eta) \rightarrow D_0$, which corresponds to restoration of the complete manifold of potential states.

4.3. Functional oppositions of upright and inverted pyramids

Table 2 systematizes the functional differences between the two operators.

Table 2: Functional oppositions in the cycle $\Phi = \iota \circ \hat{O}$

Function	Actualization \hat{O}	Deactualization ι
Direction	Convergence	Divergence
Complexity	Decreasing	Increasing
Selectivity	Maximum	Minimum
Probabilistic status	Determined event	Probability field
Memory	Fixes the past	Erases history
Direction of time	$t \rightarrow t + \Delta t$	$t \rightarrow t - \Delta t$ (reversible)
Adjoint operator	\hat{O}^\dagger	$\iota^\dagger = \hat{O}$

V. THE PAIR $\blacktriangle \blacktriangledown$ AS THE COMPLETE CYCLE $\Phi = \iota \circ \hat{O}$

5.1. Necessity of both phases

Historical and contemporary philosophies have often fallen into extremes:

- **Dogmatism** ($B = 1$): absolutization of the actual, denial of the potential. Result: rigidity, structural chaos;
- **Nihilism** ($B = 0$): absolutization of the potential, denial of the actual. Result: dissolution of meaning, apophaticism.

Only dynamic equilibrium ($0 < B < 1$), in which both operators act synchronously, leads to a self-consistent system.

5.2. The octahedron as the minimal self-consistent structure

The geometric union of upright and inverted pyramids, with bases facing each other, forms an octahedron:

$$\text{Octahedron} = \blacktriangle \cup \blacktriangledown \quad (\text{V.1})$$

The octahedron represents the minimal three-dimensional structure in which:

- there are two opposite poles (upper and lower);
- there exists a plane of symmetry (equator);
- circulation of energy and information along a closed loop is possible;
- the complete strange loop $\Psi^* = \Phi(\Psi^*)$ is realized.

5.3. Connection with β -decay and positronic phase

In the Standard Model of elementary particles, there are two processes:

Table 3: Analogy between β -decay and pyramidal geometry

Process	β^- -decay	β^+ -decay
Particle	Neutron	Proton
Transformation	$n \rightarrow p + e^- + \bar{\nu}_e$	$p \rightarrow n + e^+ + \nu_e$
Geometry	Upright pyramid \blacktriangle	Inverted pyramid \blacktriangledown
Operator	\hat{O} (actualization)	ι (immersion)
Energy	Released	Absorbed
Arrow of time	\rightarrow	\leftarrow (reversible)

The positron (e^+) in physics can be interpreted as the “positronic phase” of the electron — a phase in which the electron is temporarily “immersed” in the Antiworld before returning.

VI. THE INVERTED PYRAMID AND SPIRAL DYNAMICS

6.1. Spiral character of the cycle and violation of π

The cycle $\Phi = \iota \circ \hat{O}$ is not a perfect closure. Rather than returning to the initial state Ψ , the system arrives at state Ψ' , slightly displaced in phase space. This displacement has a spiral character and is related to the principle:

$$\pi \neq 3 \quad (\text{metaphorically}) \quad (\text{VI.1})$$

Mathematically, this means that $\Phi(\Psi) \neq \Psi$ for most states, and only at the fixed point Ψ^* is the closure condition satisfied.

6.2. Baryonic asymmetry at planetary scale

The spiral character of the cycle on a global scale leads to baryonic asymmetry of structures. If we assume that pyramids are geometric realizations of the operators \hat{O} and ι , then the direction of their construction (north to south, east to west) should correspond to the direction of the planet's spiral. This explains the orientation of the Great Pyramids of Egypt relative to the cardinal directions.

VII. PHYSICAL AND GEOCULTURAL CONSEQUENCES

7.1. Places of power and places of transformation

In the context of ODT OE:

- **Places of power** — regions where the operator \hat{O} dominates (upright pyramids). Here the actual manifests with maximum intensity. Examples: mountain peaks, temples, pilgrimage sites.
- **Places of transformation** — regions where the operator ι dominates (inverted pyramids). Here transformation, deactualization, and return to the potential occurs. Examples: depressions, underground chambers, catacombs, sacred wells.

7.2. Underground chambers of pyramids

If the pyramids of Khufu or Khafre are architectural realizations of the operator \hat{O} , then there should exist symmetric underground structures (inverted pyramids) realizing ι . These structures may be located:

- beneath the pyramid's base (in the form of a black chamber);
- on the pyramid's axis, but at an opposite (negative) depth;
- as a network of corridors forming an inverted pyramidal structure.

7.3. Initiatory practices

Many ancient initiatory traditions (Egyptian mysteries, Freemasonry) included two stages:

1. **Ascent** — the path through the outer chambers of the temple to the sanctuary (realization of \hat{O});
2. **Immersion** — descent into underground chambers, silence, death and rebirth (realization of ι).

The complete initiatory cycle corresponds to the octahedron $\blacktriangle\blacktriangledown$, where each phase is necessary for the transformation of the consciousness of the initiate.

7.4. Dimensionality of the observer $d(O)$ and depth of immersion

The dimensionality of the observer's consciousness $d(O)$ is correlated with the depth of their ability to immerse:

$$\text{Depth of immersion} = \frac{d(O) - 3}{2} \quad (\text{VII.1})$$

A human with three-dimensional perception (space plus time) can immerse only to a limited depth. Development of consciousness (increase of $d(O)$) allows reaching deeper levels of the potential world.

VIII. THE PAIR OF PYRAMIDS $\blacktriangle\blacktriangledown$ AND CROSS-SCALE ENTANGLEMENT

8.1. Decomposition by levels

The Hilbert space of potential states can be decomposed into a direct product of spaces at different scales:

$$\Psi^* \in \mathcal{H} = \bigotimes_{d \in \mathbb{Z}} \mathcal{H}_d \quad (\text{VIII.1})$$

where the index d enumerates levels (quantum: atoms, molecules; classical: living organisms; planetary: pyramids; cosmic: galaxies).

8.2. Non-zero entanglement entropy

At each level d there exists a reduced density matrix ρ_d with weakly non-zero entanglement entropy:

$$S(\rho_d) = -\text{Tr}(\rho_d \log \rho_d) > 0 \quad (\text{VIII.2})$$

This indicates that each structural level (including architectural pyramids) is entangled with other levels through the operator Φ .

8.3. Positrons hidden in protons (at planetary scale)

Thus, positrons and other positronic phases of matter do not disappear but transition into inverted (underground, hidden) structures. At the planetary level, this corresponds to the depths of the Earth, its magnetic field, and geothermal energy — all of which can be understood as the “positronic phase” of surface structures.

IX. HYPOTHESIS OF THE DOUBLE PYRAMID (OCTAHEDRAL STRUCTURE)

9.1. Formulation

Hypothesis: Beneath the foundations of major pyramids (in particular, the Great Pyramids of Giza) there should exist symmetric underground structures in the form of inverted pyramids, forming a complete octahedron.

These structures may be:

- chambers of black stone;
- systems of corridors oriented at an angle to the main structure;
- resonators of seismic waves of the planet.

9.2. Formal justification

The mathematical necessity follows from the fixed-point condition:

$$\Psi^* = \Phi(\Psi^*) = \iota(\hat{O}_{\Psi^*}(\Psi^*)) \quad (\text{IX.1})$$

For this equation to have a solution, it is necessary that:

1. The operator \hat{O} exists, realizable by the upright pyramid;
2. The adjoint operator $\iota = (\hat{O})^\dagger$ exists, realizable by the inverted pyramid;
3. Geometric complementarity of both operators (octahedron) is achieved.

9.3. Archaeological prediction

If the hypothesis is correct, then:

- Beneath the Great Pyramid of Khufu at a depth corresponding to its height, a black chamber should be found;
- The corridors of this chamber should be oriented at an angle of approximately 45° to the horizontal;

- At the center of the chamber, there should be a region of negative mass or anomalous gravity (the mathematical image of the immersion singularity);
- The entire system should be crystalline, ensuring coherence of wave functions.

9.4. Mathematical necessity

Without the inverted component ι , the cycle Φ cannot close. The operator \hat{O} alone creates only a unidirectional actualization process, leading to:

- irreversible entropy increase;
- heat death of the system;
- destruction of structure.

The inverted pyramid (operator ι) is necessary for *restoration* of structure and creation of dynamic equilibrium.

X. SUMMARY TABLE: UPRIGHT VS. INVERTED PYRAMID IN ODTOE

Characteristic	Upright ▲	Inverted ▼	Pair ▲▼
Geometry	Apex upward	Apex downward	Two poles
Operator	$\hat{O} : \mathcal{H} \rightarrow \mathcal{C}$	$\iota : \mathcal{C} \rightarrow \mathcal{H}$	$\Phi = \iota \circ \hat{O}$
Process	Actualization	Deactualization	Complete cycle
Energy	Concentrates	Disperses	Circulates
Entropy	Decreases	Increases	Equilibrium
Directionality	From manifold to unity	From unity to manifold	Spiral
Time	Irreversible \rightarrow	Quasi-reversible \leftarrow	Cyclic
Mass distribution	Expands toward base	Narrows toward apex	Symmetric
Geomagnetic effects	Magnetic field enhancement	Weakening, inversion	Resonance
Informational status	Determination	Dissolution	Encoding
Psychological states	Awareness, wakefulness	Sleep, meditation, death	Transformation
Scale level	Macroscopic	Microscopic	Coherence
Physical correlate	β^- -decay	β^+ -decay	β^0 (neutrality)
Symbolism	Birth, growth, ascension	Death, decline, descent	Eternal return
Archetypes	King, father, sun	Queen, mother, moon	Androgyne, darkness-light
Architectural examples	Ziggurats, pagodas	Catacombs, grottos	Secret complexes

Characteristic	Upright ▲	Inverted ▼	Pair ▲▼
Geographic distribution	Visible from outside	Hidden underground	Integrated
Necessity	Absolute for actualization	Absolute for cycle closure	System survives

XI. CONCLUSION

The main conclusions of the research:

1. **Geometric correspondence.** The inverted pyramid (apex downward) naturally is interpreted as the geometric realization of the immersion operator $\iota : \mathcal{C} \rightarrow \mathcal{H}$ in the ODTOE formalism. This correspondence is supported both by heuristic arguments and mathematical analysis.
2. **Completeness of the cycle.** Only the composition of two operators — actualization \hat{O} and immersion ι — creates a closed cycle $\Phi = \iota \circ \hat{O}$ necessary for the existence of the fixed point Ψ^* and system self-consistency.
3. **The octahedron as universal form.** The geometric union of upright and inverted pyramids forms an octahedron — the minimal three-dimensional structure possessing all necessary properties for a complete cycle of self-observation. This form repeats from atomic orbitals to galactic structures.
4. **Physical analogies.** The connection between the inverted pyramid and the positronic phase (β^+ -decay) demonstrates that quantum mechanics already contains the principle of duality of actualization and immersion, merely awaiting geometric interpretation.
5. **Archaeological prediction.** The hypothesis of octahedral structures beneath major pyramids is subject to empirical verification. If this hypothesis is correct, it will provide strong confirmation of ODTOE and revolutionize the understanding of ancient civilizations.
6. **Philosophical significance.** The inverted pyramid symbolizes the necessity of balancing the actual and the potential, consciousness and the unconscious, life and death. It emphasizes that the fullness of existence requires both directions of transformation.

Further research should focus on:

- mathematical development of the theory of operators \hat{O} and ι with explicit specification of their spectra;
- search for architectural and geological evidence of octahedral structures;
- experimental verification of ODTOE predictions under laboratory conditions.

CONFLICT OF INTEREST

The author declares the absence of conflict of interest.

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