

The Summary Version

*The Theory of Natural
Individuals*

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The Theory of Natural Individuals

- The Theory of Causal Significance
- The Carrier Theory of Causation
- The Consciousness Hypothesis

Russell/Whitehead View

- **Russell** = Physics is structure
- **Whitehead** = “Vacuous” actuality is not possible
- **Implies**: Physical entities have intrinsic content not specified by physics

Questions raised

- **The “combination” problem**
 - **How could intrinsic content exist at a middle level?**
- **Panexperientialism**
 - **When is intrinsic content experiential, and why?**
- **Other peculiar features**
 - **Unity**
 - **Correspondence to information structure**
 - **Subjective Instant**

The Theory of Causal Significance

- **Causal Significance** = The constraint the occurrence of an event (or the presence of an individual) places on the possible ways the world could be.
- **Nomic Content** = The properties a thing has which contribute to its causal significance
 - Effective Properties
 - Receptive Properties

Nomic Content

- **Basic tenet:** Considered in themselves, effective and receptive properties each have an *incomplete nature*.

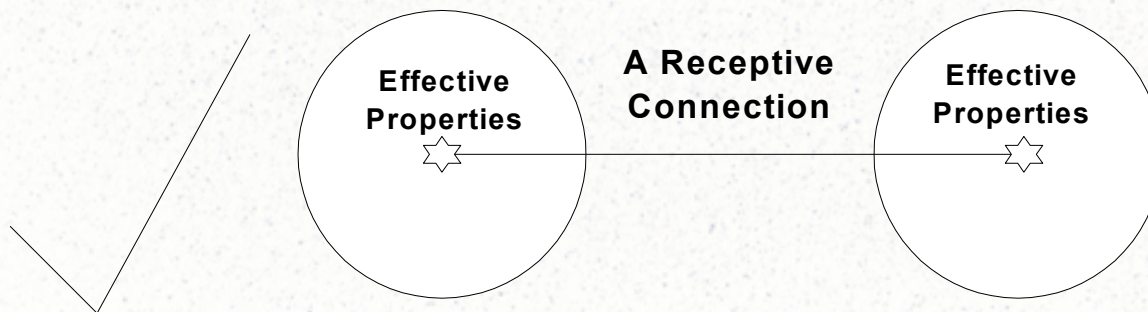
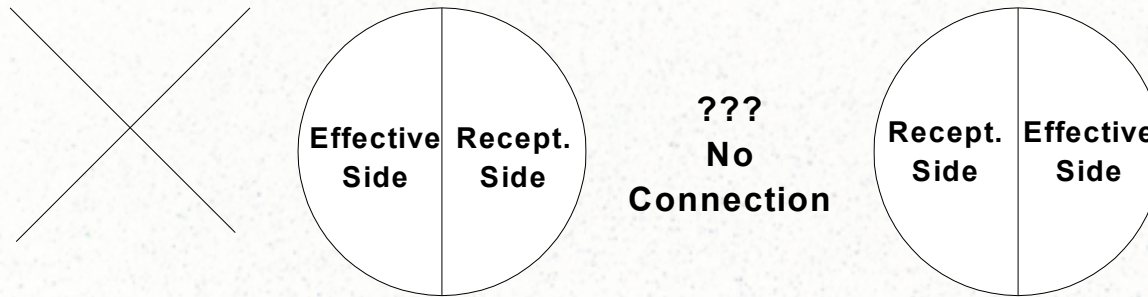
Nomic Content

- Considered in themselves, each kind of property has an *incomplete nature*.
- **Effective Properties** = Determinable properties that contribute to constraints on the determinate states of a causal nexus.
- **Receptive Properties** = Connective properties facilitating the creation of causal nexii and enabling individuals to be sensitive to constraints on the nexii of which they are members.

Effective Properties

- **Incomplete *determinable* properties**
 - Multiple potential values
- **Intrinsic relations of compatibility, inclusion, and exclusion**

Receptive Properties



Special *properties* whose instances can *bind* to more than one individual at a time.

Binding creates a new individual to whom the receptivity *belongs*.

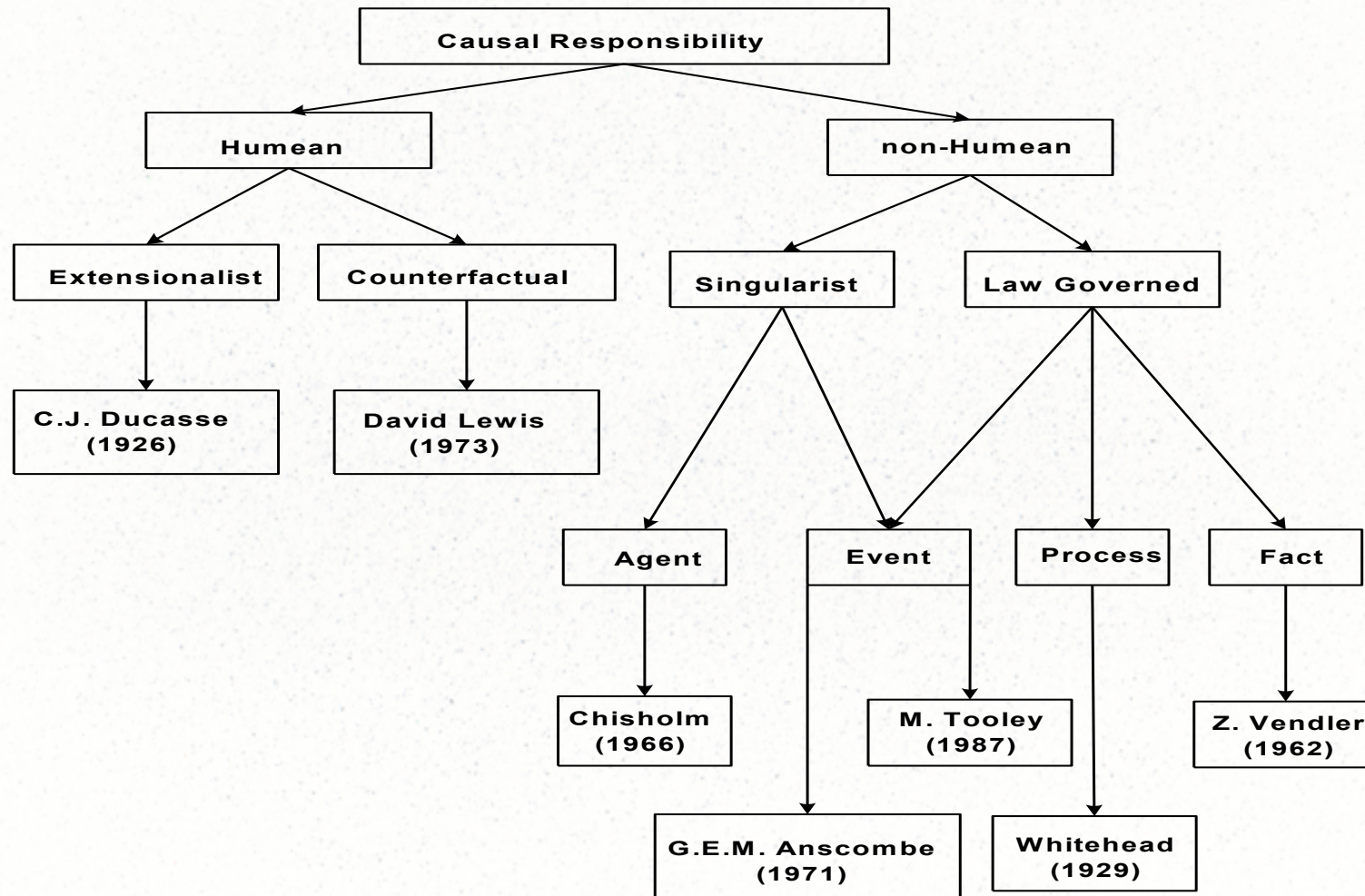
The Importance of Binding

- Determinable becomes more determinate
- Incomplete becomes more complete

Two Fundamental Causal Principles

- Determination indicates completeness.
- Individuals seek completeness.

A Taxonomy for Traditional Theories of Causation



Causal-and-Effect Is Not Entirely Objective

- **Negative facts** (starving to death)
- **Figure/ground relations** (cue ball on the break)

Causal-and-Effect Is Not General Enough

- Breaks down in **rich feedback** systems
(Palestinian/Israeli dispute)
- Breaks down in **quantum systems** (EPR)

Receptive Connections are Causal Connections

Each receptive connection makes the world more determinate by reducing the possible joint-states of the individuals bound to it.

Receptive connections are operators on a space of possibility

The receptive connection of each individual filters the possibilities for the joint-states of its members

- Prior possible joint-states \rightarrow posterior possible joint states
- Posterior possible joint-states = x : $x \in$ power set of prior possible joint states

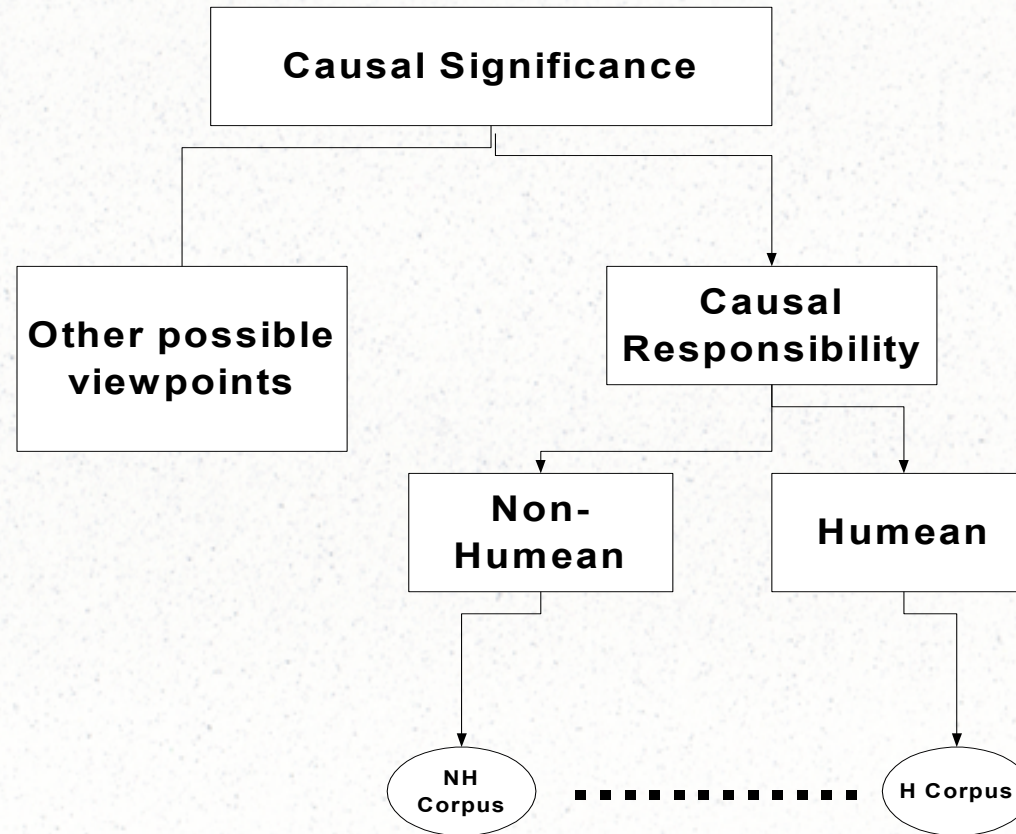
Definition of Natural Individual

- **Base Case:** Any basic effective or receptive property is a natural individual
- **Inductive Case:** Any set of natural individuals sharing a completed receptive connection is a natural individual.

General Parameters Of Cause-and-Effect

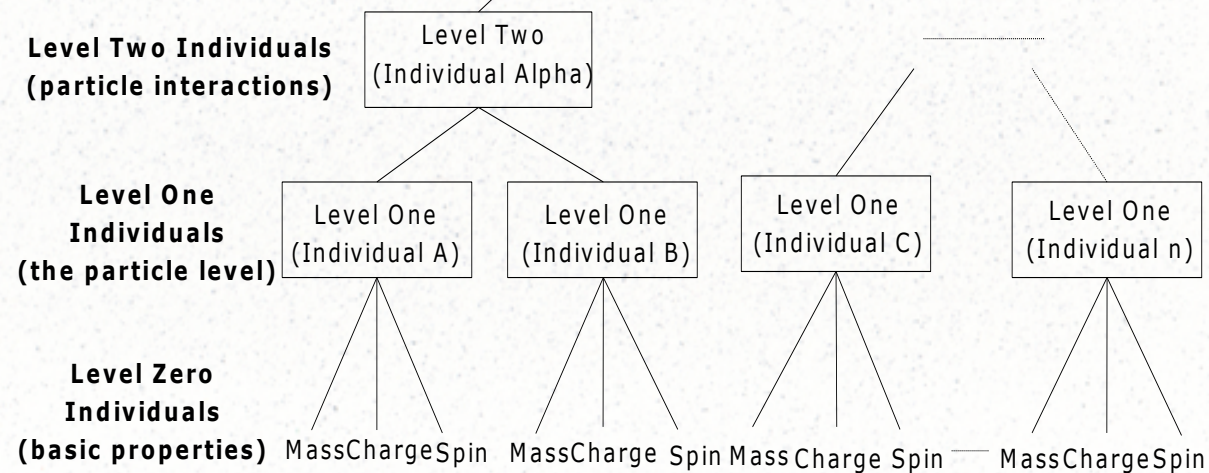
- The **arity** of the relation (how many things related)
- The **kinds of things** related (events, facts, individuals)
- **Symmetry** (can we distinguish between cause and effect)
- **Directionality**
- **Locality**

The Generality of Causal Significance



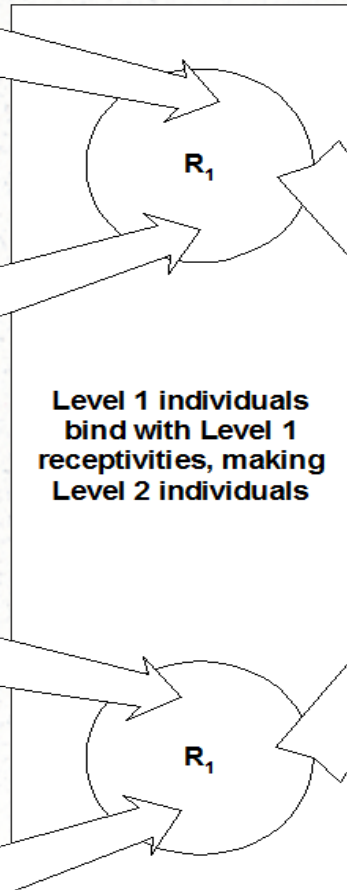
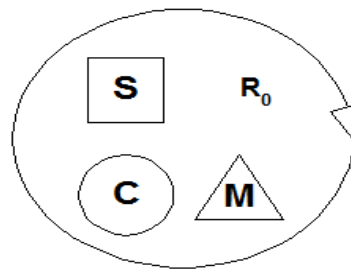
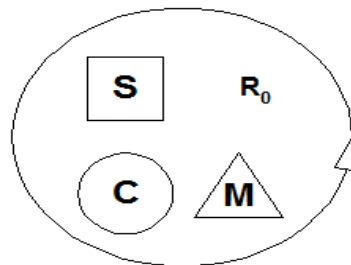
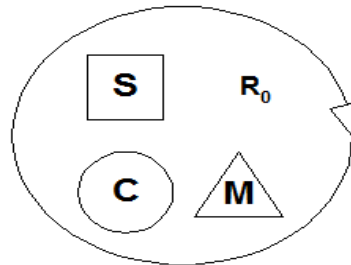
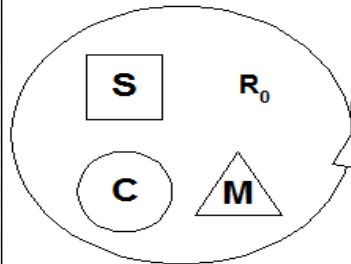
The Hierarchy of Natural Individuals

Nature is partitioned into individuals at many levels. Each level's individuals are constituted by the existence of a shared receptive connection binding to individuals from a lower level.



M = Mass **S** = Spin **C** = Charge **R_n** = Receptivity of level n

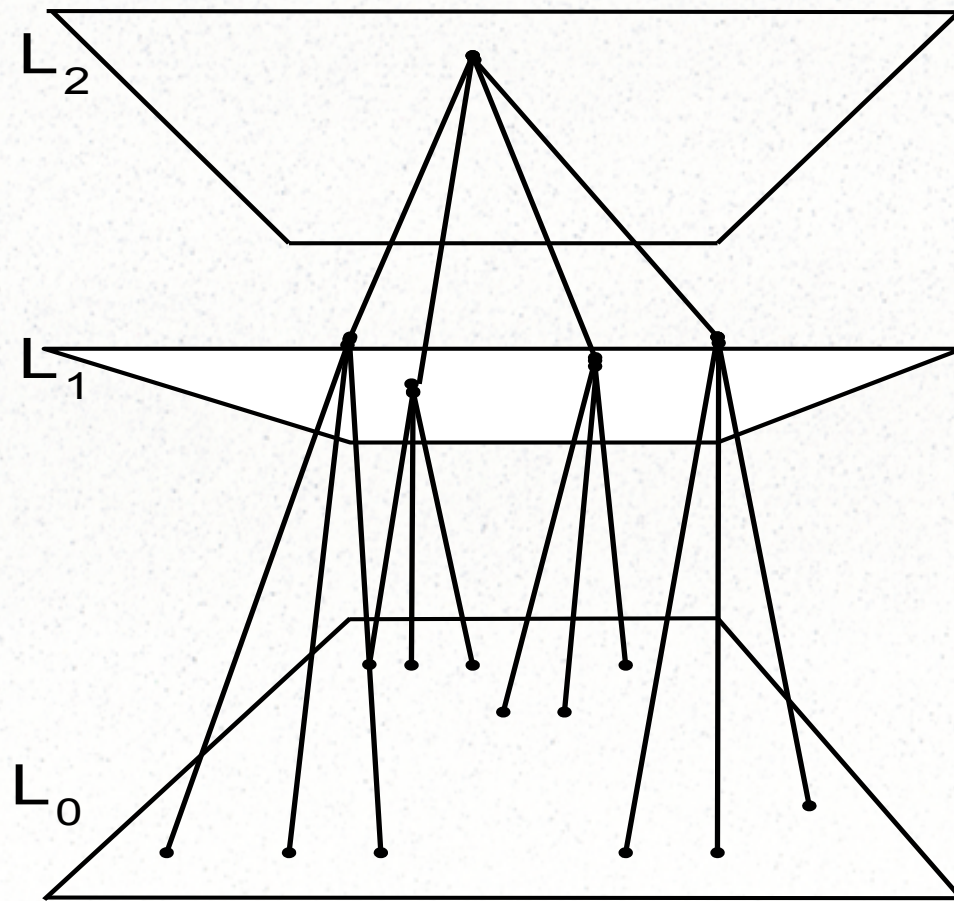
Level 1 individuals



And so on.....

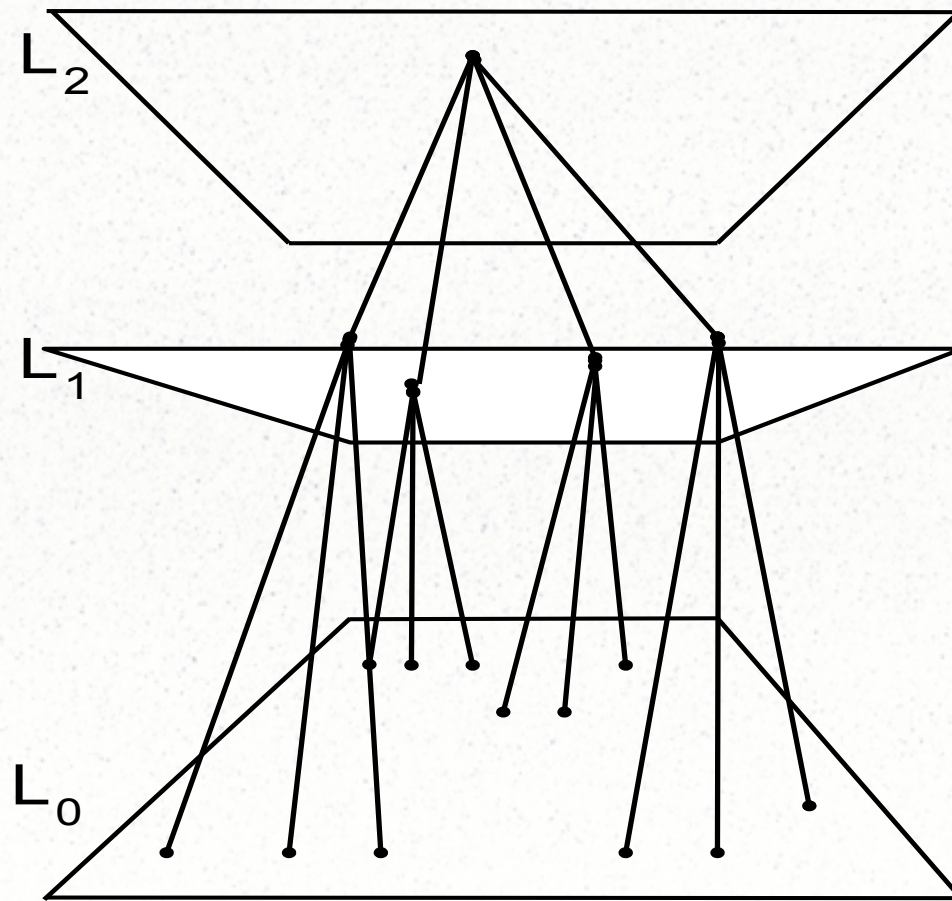
Each Individual Possesses An Irreducible Receptive Connection

The levels of nature are strongly emergent, not merely constitutive



Causal Responsibility Across Levels of Nature

Material
Causation



Final
Causation

Efficient Causation

The Theory of Causal Significance as meta-physics

- **The theory evokes superposition and the measurement problem;**

The Theory of Causal Significance as meta-physics

- **The nature of causal significance is consistent with the existence of quantum coherence;**

The Theory of Causal Significance as meta-physics

- **The view makes non-local causation seem expected, rather than mysterious or unexpected;**

*The Theory of Causal Significance as
meta-physics*

**Nothing in the theory makes irreducible
randomness a surprising feature of the world;**

The Theory of Causal Significance as meta-physics

- **The spacetime that we could perhaps construct from causal connections would clearly be relativistic;**

The Theory of Causal Significance as meta-physics

- **Like QM, the theory dilutes the special ontological importance of the microphysical (as pointed out by Lockwood);**

The Theory of Causal Significance as meta-physics

- **The theory's realism about possibility is consistent with the ability of counterfactual truths to have measurable effects in the quantum world.**

The Theory of Causal Significance as meta-physics

- **Moral: *if* causation works the way the Theory of Natural Individuals says, *then* it is not surprising that our physics looks the way it does.**

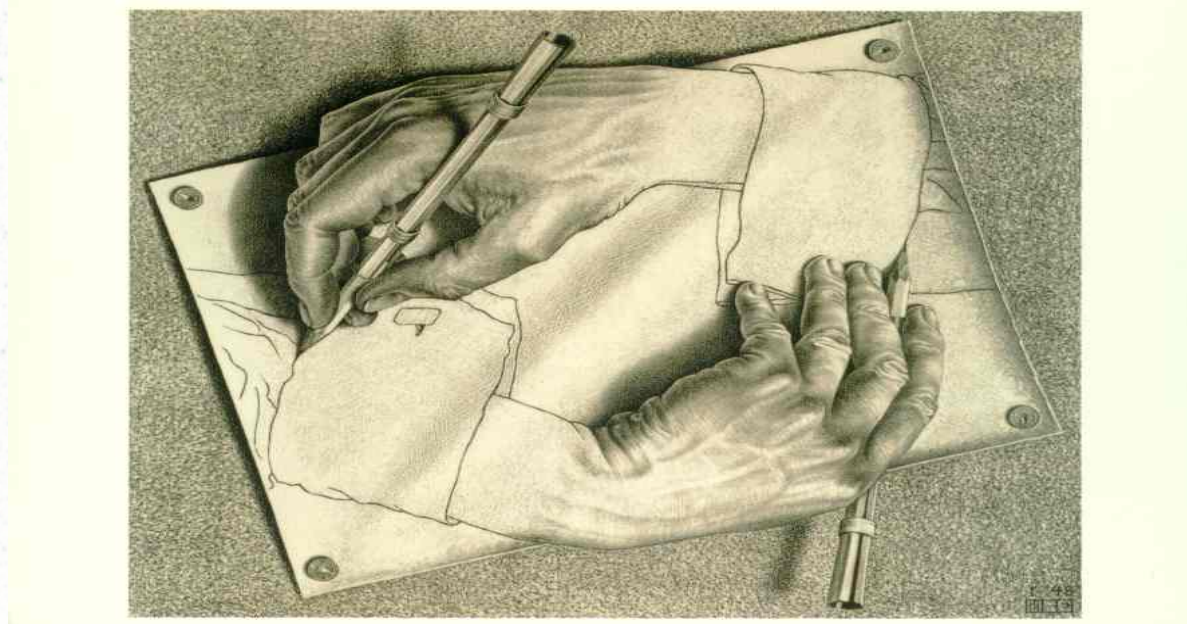
The Carrier Theory of Causation

- **Something is a natural individual if, and only if, it is experiencing phenomenal individuals.**

The Carrier Theory of Causation

- **Effective properties are carried by phenomenal properties.**
- **Receptivity is carried by experiential properties.**

The Carrier Theory of Causation



The Causal Connection Itself Has A Special Kind of Intrinsic Content Complementary To The Physical