

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*.

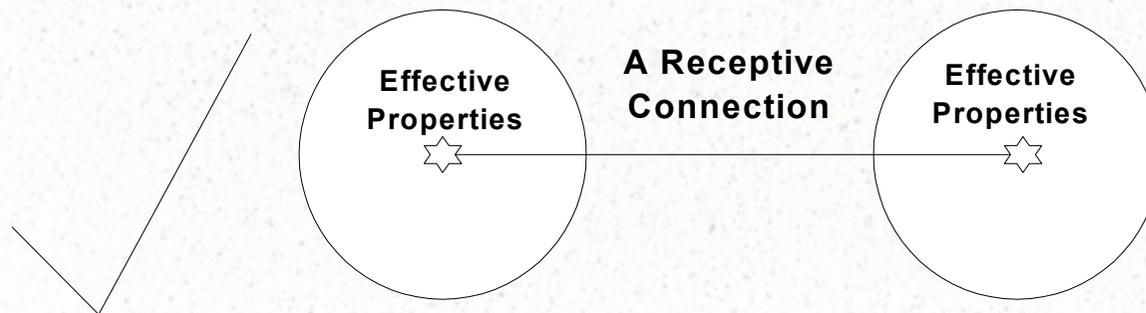
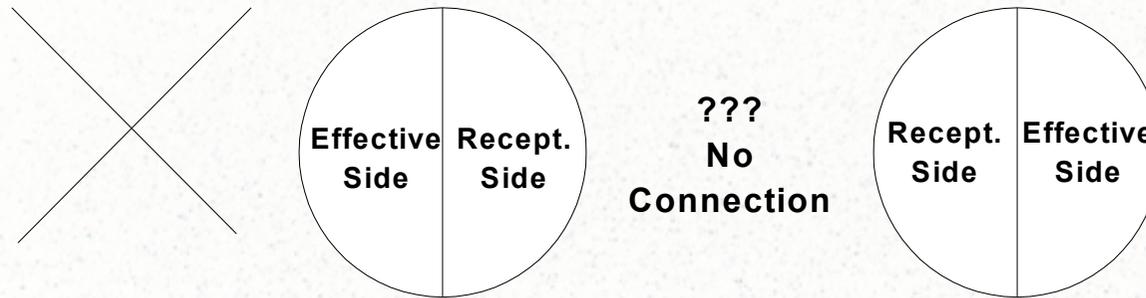
## *Nomic Content*

- 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*.**

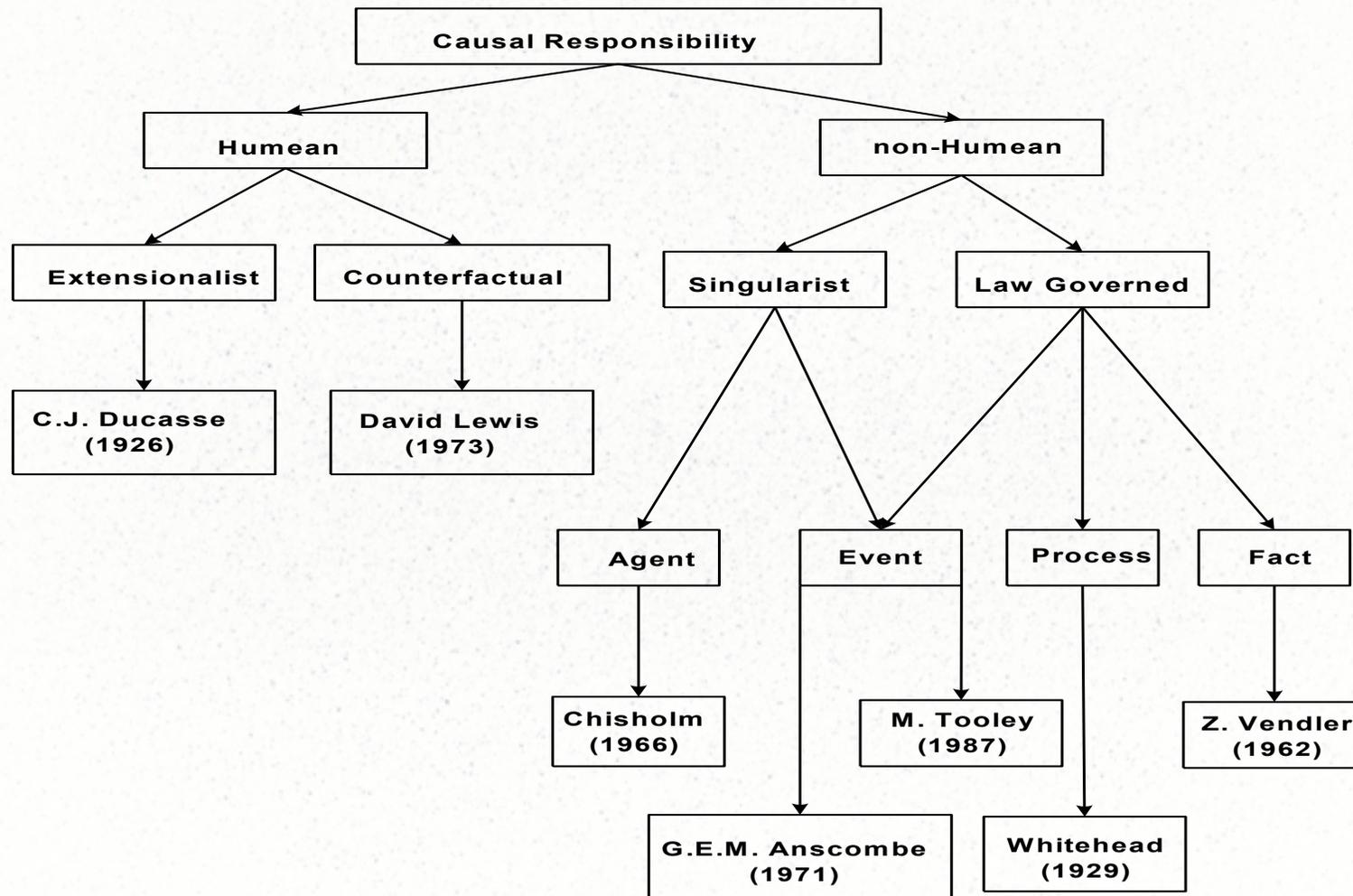
## *The Importance of Binding*

- 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

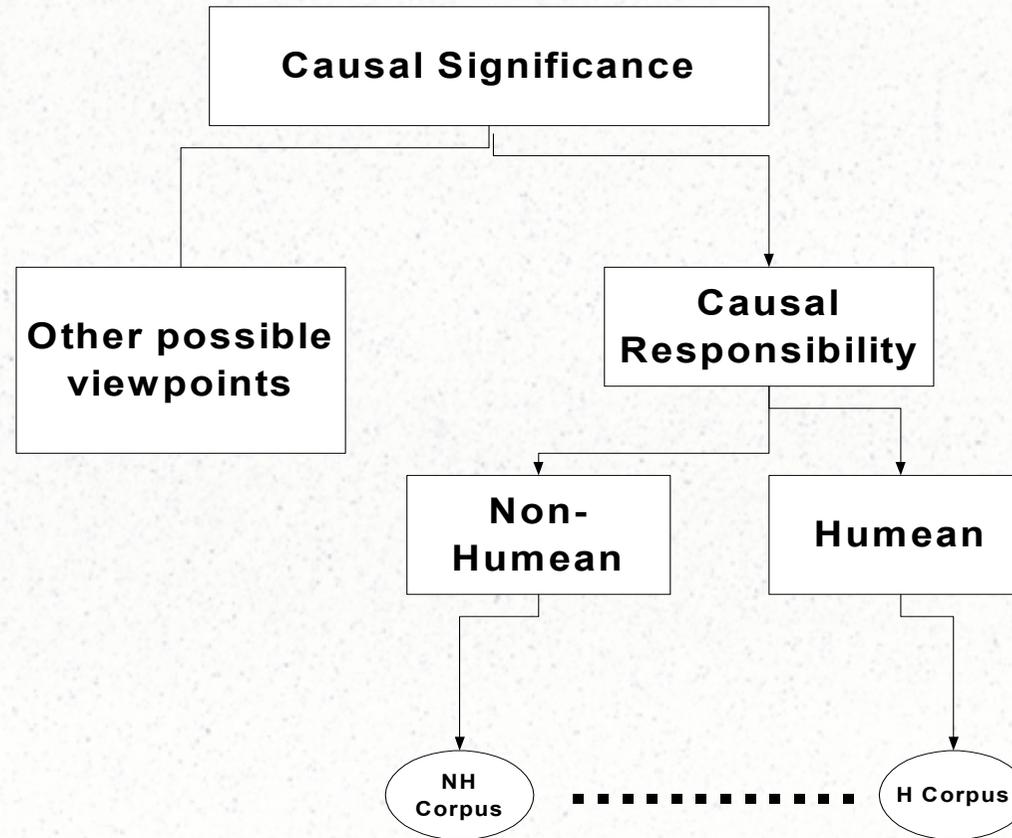
## *Definition of Natural Individual*

- **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*

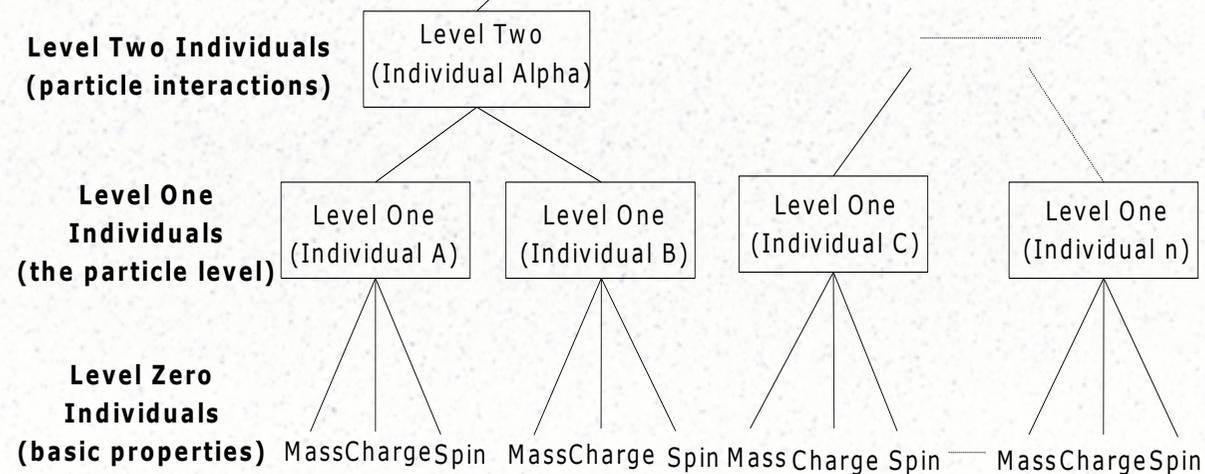
- The **arity** of the relation (how many things related)
- The **kinds of things** related (events, facts, individuals)
- **Symmetry** (can we distinguish between cause and effect)
- **Directionality**
- **Locality**

# The Generality of Causal Significance



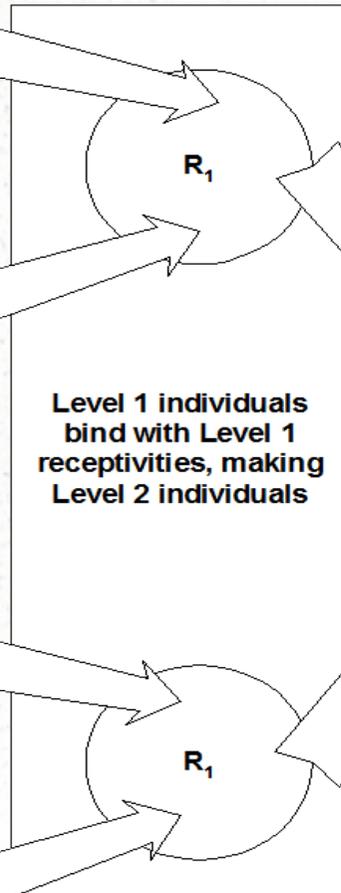
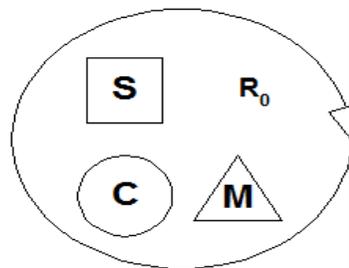
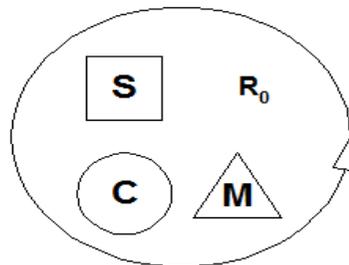
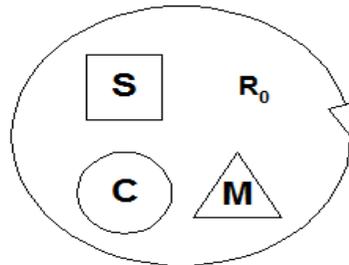
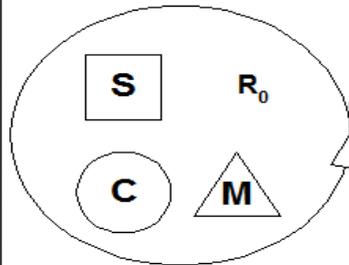
# The Hierarchy of Natural Individuals

**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<sub>n</sub>** = Receptivity of level n

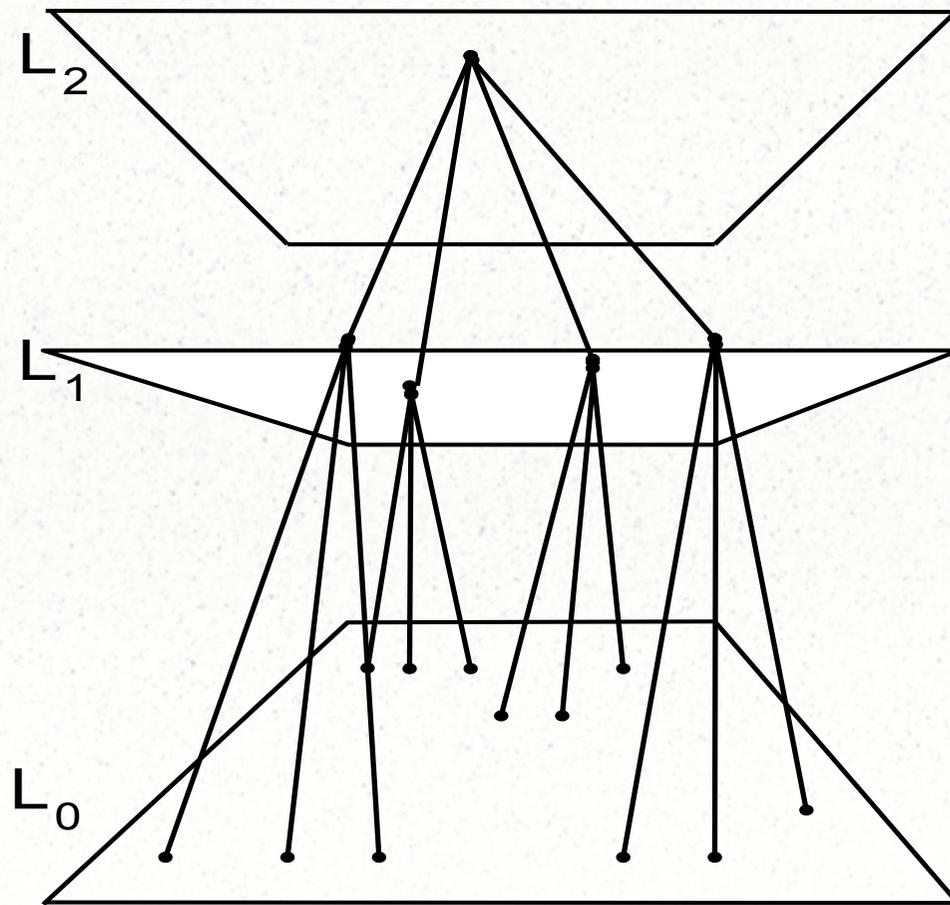
Level 1 individuals



And so on.....

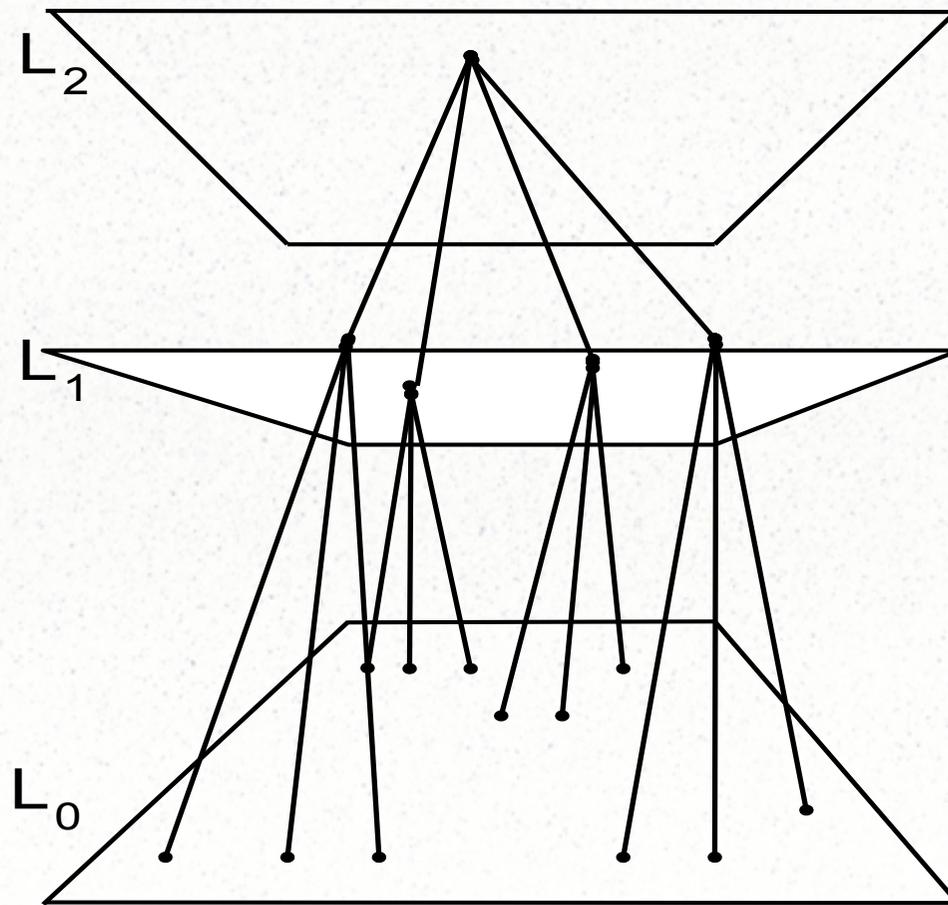
Each Individual Possesses An Irreducible Receptive Connection

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.**

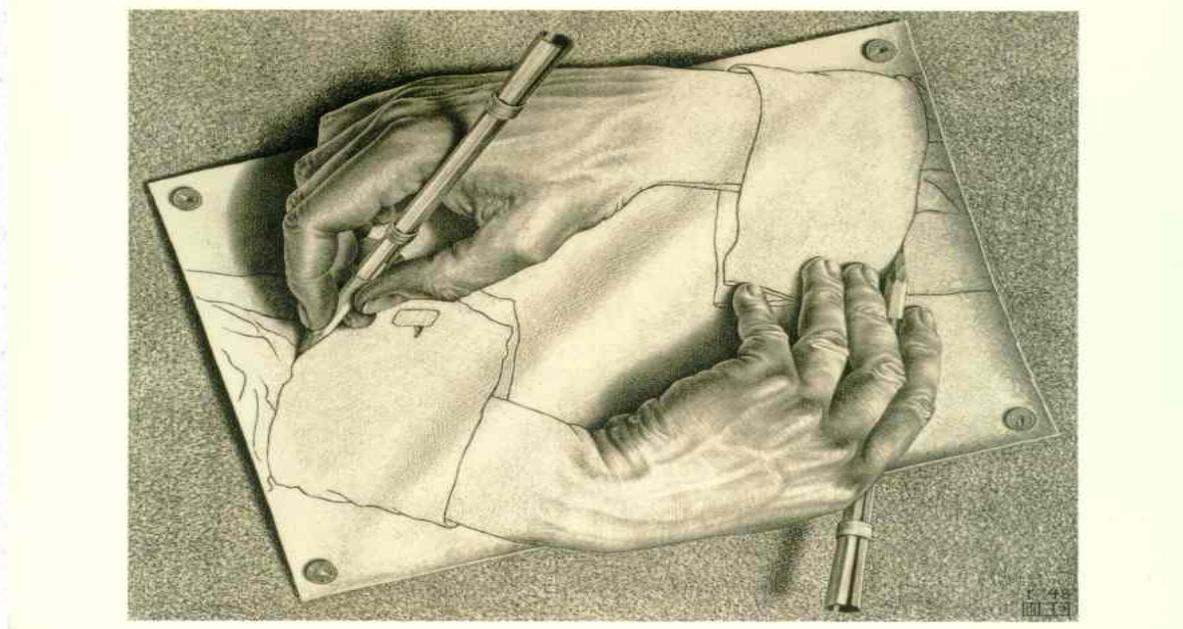
## *The Carrier Theory of Causation*

- **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**