

Minds form a Discrete Degree in the same way that the Physical has Discrete Degrees

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Written in online abstract



Mind and Physics

Want:

- Constructive Theories
- 'Generative Realism'

Then

- Distinct Mental and Physical
- Causal Theory linking Mind and Nature

So

- Laws of Mind (Psychology!)
- Beginning of unified science

Avoid:

- Just negative arguments
- Just Property Dualism
- Just Epiphenomenalism
- Just Information or Mathematics
- Just Nondualism
- Physical Closure:
every cause being physical
- 'Anything goes' in the mind
- Purely 'simple' minds,
Unextended minds
- also: Spatial minds (!)

Slogan of 'Generative Realism':

No function without structure or form, no structure without substance,
no substance without power, no power without function.

Method

Physics

- Look at quantum physics, field theory & quantum gravity as generative realism
- Take seriously substance, cause via dispositions and how they exist.
- Look for
 - Propensity, giving:
 - Distributed Form, giving:
 - Selection Effect
- Multiple Generative Levels: how some things cause others to exist.

Mind & Spirit

- Find a 'guru' with 'inner' experience & rational ideas
- *Consider*: Plato, Aristotle, Plotinus, Aquinas, Spinoza, Descartes, Leibniz, Kant, Hegel, Whitehead, Cohen, ...
- *Select*: Emanuel Swedenborg (1688 - 1772), who has much personal experience of mental & spiritual realms, *and* has presented rational ideas for their comprehension. (An under-used resource!)
- He uses 'Generative Realism'

Synthesize!

Propensities in Philosophy

Dispositions, Powers

- e.g. Fragility, hardness, etc.
- Dispositions
 - Exist continuously in time
 - Manifest if Specific Condition
 - Manifestation is an Event
 - May or may not be changed after the Effect, as that Event may be a new Specific Condition.
- Much debate: but they are
 - Not reducible to structures.
 - Not reducible to conditions.
- See: Harré, Molnar, Bird, Handfield, www.generativescience.org

Causation

We must Distinguish:

- Principal Cause:
 - The Disposition which operates
- Occasional Cause
 - The Specific Condition
- Instrumental Cause
 - The Principal Cause of the Specific Condition.
- Example: dropping a pebble -
 - Principal: Gravity
 - Occasional: Event of release
 - Instrumental: My hand muscles

Propensities in Physics

Classical Physics

- *potential energy field*: the disposition to generate a force,
- *force*: the disposition to accelerate a mass,
- *acceleration*: the final result.

Quantum Physics

- *Hamiltonian (energy) operator*: the energy op to generate the wave function by evolving it in time,
- *wave function*: the probabilistic disposition (a "propensity wave") for selecting measurement outcomes,
- *measurement outcome*: the final result.

Quantum Field Theory

- *Lagrangian*: disposition to generate all virtual processes in spacetime.
- *Virtual Particles*: disposition to produce virtual events
- *Virtual Events*: production of mass and potential energies for the Hamiltonian.

Quantum Gravity

- *To be discovered*: pregeometric dispositions to generate Lagrangian and spacetime.

Notice the Generative Stages!
Triads of: propensity, distributed form, effect.

Propensities in Swedenborg

In the mind:

propensities are loves.

These act in three stages:

1. Loves *per se* are substance
 2. Loves entertain choices as 'thoughts', and so can choose one for action.
 3. Loves produce action by means of thoughts.
- Action selects future possible choices.

Hence:

Derivative loves (affections) act again a similar way.

So result is 'a functional image' of its cause.

Correspondences:

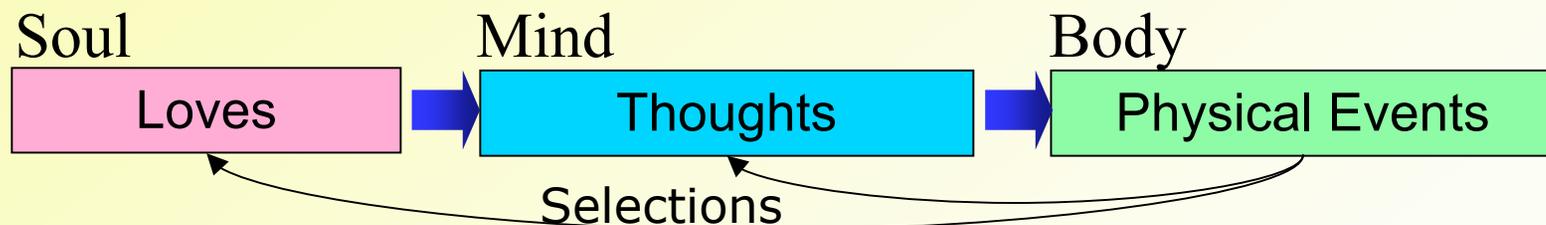
- Have alternation of principal and selection causes.
- This will repeat itself longest if the *patterns* of the constituent events are most similar in the two degrees.
- By a sort of survival of the fittest, this in the long term gives rise to similarities or correspondences of function between adjacent degrees.

Note how pattern 1>2>3 here is similar to that of physical processes.

Mental & Physical: Discrete Degrees Together?

Main Hypothesis

- Minds and Brains: together Multiple Generative Levels
- Loves produce Physical Propensities by Thoughts
- Physical Actions select future Loves & Thoughts.



Further

- Each Discrete Degree exists simultaneously in its own way.
- Similar dynamical principles in each Parts as in the Whole, as described by the correspondences.

Examples coming!

The Big Picture!

Mental as a Discrete Degree

Consequences

- Similarities (Correspondences) of Mental and Physical Functions,
- Detailed Correlations between mental and neural processes

Causal Interactions

- Mental (& Spiritual) Development depends on physical actions by brains/bodies for permanence,
- Interaction between Minds and Brains is a delicate balance of Propensities from mental Loves and Constraints by selections of past physical processes.

The Bigger Picture

Each Level has the Same Triadic Structure inside it.

- Love: dealing with motivations, thoughts, actions
- Thoughts: of love, of ideas, of actions
- Physical: of dispositions, of forms, of effects.

Each of the sublevels should have further Triadic sublevels!

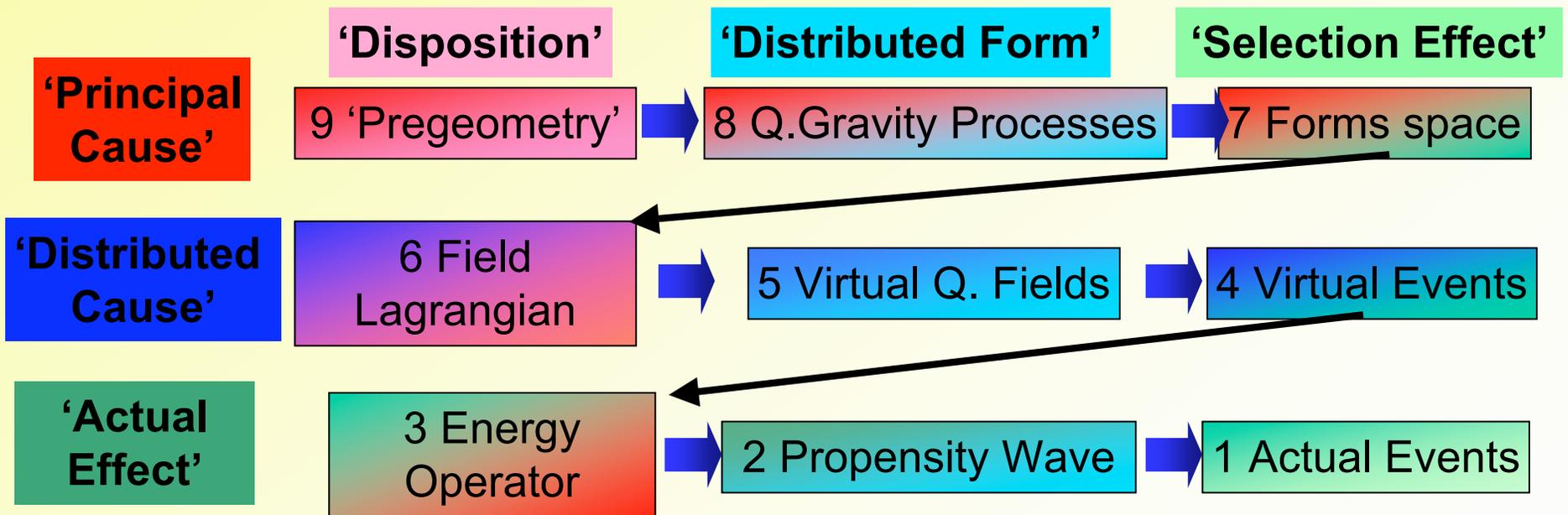
Is there Evidence?
-from Physics?
-from Psychology?

| SOUL | MIND | BODY |
|-------------------|---------------------|----------------|
| LOVE | THOUGHTS | PHYSICAL |
| Celestial | Adult (Loves) | Deep Causes |
| Spiritual | Youth (Intellect) | Field Theory |
| Spiritual-Natural | Childhood (Actions) | Object Effects |

Swedenborg's
names
Tucson 2008

Discrete Degrees in Physics: The Physical Ennead (=9)

We see patterns of **Discrete Degrees** repeated through Physics.
I call this a system of **Multiple Generative Levels**, in nested triads.



Final Effects influence later processes by Selection.

Discrete Degrees in Minds

Jean Piaget has Described Stages of Cognitive Growth

- These can be described as discrete 'layers' of cognitive structures.
- Links (semantic nets) within each layer,
- 'Generative Grammars' link one layer to the next (not fixed nets, but something procedural).
- We assume 'post-formal' stages after Gowan and Commons.

| Discrete Stage n | Cognitive Structures forming n by relating $n-1$ | Developed in Piaget's Stage | During ages |
|--------------------|--|---------------------------------|-------------|
| 6 | meta-theories, paradigms | creative (after Gowan, Commons) | 17– |
| 5 | plans, models, formalisms | formal | 12–16 |
| 4 | classes, series, numbers | operational | 7–11 |
| 3 | single relations | intuitive | 4 –6 |
| 2 | sentences | preconceptual | 2 –3 |
| 1 | objects | sensorimotor | 0 –1 |
| 0 | sensory and motor systems | (initial biology) | – 0 |

Cognitive Discrete Degrees

- Stages of Cognition should parallel (\Leftrightarrow) physical discrete degrees, remembering:
 - Dispositions \Leftrightarrow Loves
 - Distributed Forms \Leftrightarrow Thoughts
 - Effects \Leftrightarrow Actions
- Piagets' 5 Stages of Cognition needed to 'understand':
 - Actual events \Leftrightarrow from knowledge of objects (**sensorimotor**)
 - Object dispositions \Leftrightarrow from sentences (**preconceptual**)
 - Energy conservation \Leftrightarrow from single relations (**intuitive**)
 - Virtual events \Leftrightarrow from reversible operations (**operational**)
 - Virtual particle fields \Leftrightarrow from formal structures (**formal**)

The Cognitive Ennead

- Arrange Piaget's Stages into a 'Periodic Table'
As suggested by Gowan & Commons, later from Swedenborg.

| | | You | I, Me | It, They |
|----------------------|------------------|----------------------------|----------------------------------|-----------------------------------|
| ADULT Motivation | Gowan-Swedenborg | 9 ... Wisdom | 8 40+ yrs Reformation | 7 26-40 yrs Conscience |
| YOUTH Thought | Piaget-Gowan | 6 18-25 yrs? Creativity | 5 13-17 yrs Formal operations | 4 7-12 yrs Concrete operations |
| INFANT Sensations | Piaget | 3 4-6 yrs Intuitive | 2 2-3 yrs Preoperational | 1 0-1 yrs Sensorimotor |

- Should also link corresponding affections and cognitions.

The Biggest Picture

The Physical Ennead is the final triad (effects),
 The Mental Ennead is the middle triad (exterior mind),
 And a New Ennead is the first triad (spiritual mind/soul),
 of this Big Ennead.

| SOUL love | MIND thoughts | PHYSICAL effects |
|---------------------|----------------------------------|--|
| Celestial | Adult (Loves) | Reception of Mental Effects |
| | Wisdom Reformation Conscience | Pregeometry Quantum gravity Forming Space |
| Spiritual | Youth (Intellect) | Field Theory |
| | Creative Formal Operational | Lagrangian Virtual Particles Virtual Events |
| Spiritual-Natural | Childhood (Actions) | Quantum Mechanics |
| | Intuitive Intuitive Sensorimotor | Energy Operator Wave dispositions Selection Events |

Mental Ennead

Physical Ennead

What is Mental Space?

- Any Space defined by extensive relations.
 - Physical or Pregeometric or other.
- Some 'space' is needed to individuate minds, to allow interactions $M \leftrightarrow M$ and $M \leftrightarrow P$ [see eg Kim].
- By present Hypothesis:
 - Loves are related by 'what functions they would do',
 - So: there is a Mental Space based on quality of function.
It is Distinct from Physical Space.
 - Some functions are about Relations in Physical Space:
These are Images that can be Perceptions.
- So:
 - Minds are not in Physical Space, but in their own space.
 - Not at points in physical space.
 - Loves produce Physical Space
 - So: can be said to be 'everywhere they act' \Rightarrow "extended"

Conclusions

By method of 'Generative Realism':

- We see Discrete Degrees in Quantum Physics
 - These form Multiple Generative Levels.
- See also Discrete Degrees in Psychology
 - In Cognitive and Affective Stages
- Mental & Physical: Discrete Degrees Together!
 - Generalised & generative dualism of mind and nature
 - Still constant relations by causal connections of similar kinds to those already discovered.
 - We have already begun to investigate this in detail even though we have not yet seen the whole picture.
 - Expanded rational picture of Emanuel Swedenborg.

Affections and Cognitions: The Mental Ennead (2)

- Erickson's Affective Stages & Piaget's Cognitive Stages (extend by Gowan and Swedenborg as before).
- Note the periodic emphasis and intersection of themes.
- Examples: Stage 4 is 'concrete operations within thoughts'. Stage 8 is 'thoughts about loves (and changing them)'.

| | | Loves | Thoughts | Actions |
|--------------------------|--|--|--|---|
| ADULT Loves | Erikson-Swedenborg (affective) Gowan-Swedenborg (cognitive) | Compassion-love 9 ... Wisdom | Regeneration 8 40+ yrs Reformation | Right Living 7 26-40 yrs? Conscience |
| YOUTH Thoughts | Erikson (affective) Piaget-Gowan (cognitive) | Intimacy 6 18-25 yrs? Creativity | Identity 5 13-17 yrs Formal operations | Industry 4 7-12 yrs Concrete operations |
| INFANT Actions | Erikson (affective) Piaget (cognitive) | Initiative 3 4-6 yrs Intuitive | Autonomy 2 2-3 yrs Preoperational | Trust 1 0-1 yrs Sensorimotor |

This is Very Similar to the Physical Ennead!

Abstract

If we examine the natural structures found by quantum physics, we find that energy operators, quantum-mechanical propensities and outcome-events form a triple set of 'material discrete degrees'. This is in the sense that they simultaneously exist in their own way, without being reduced to another. Furthermore, the energy operators (Hamiltonians) generate the propensities (wave functions), which in turn generate actual outcomes. (Even though we do not yet know the timings of the last step, we have many hypotheses.) I therefore name this triple as of 'discrete degrees', or 'multiple generative levels'. A similar set can be found if we take quantum gravity (pregeometric processes) to generate Lagrangians for virtual processes in spacetime, which in turn generate the triple (sub)degrees of energy/propensity/actual-event. (Even though we do not yet know the details of pregeometric processes, we are forming many hypotheses.)

Now, just as the first 'material triple' is the set of sublevels in the final level of a more global 'physical triple', I now hypothesize that the physical triple is again a set of sublevels in the final level of a yet more global triple. This global triple, for reasons to be given, is taken to be composed of two new parts: namely some kind of 'spiritual' processes followed by some kind of mental processes. We assume that the 'recursive nesting' pattern of levels and sublevels is repeated, so we have some guidelines for exploring these new degrees. There is already evidence from stage developmental theories of Erikson, Piaget, Gowan and Commons that the mental degrees have multiple sublevels of affectional and cognitive development of the required kinds. There is further empirical evidence from Swedenborg that the spiritual degrees have similar substructures, and indeed he hypothesizes that this 'multiple generative level' pattern is universal.

We therefore need to integrate our knowledges from physics and psychology (and, as necessary, from elsewhere) to ascertain the true nature of the discrete degrees as identified here, and see whether they in fact form a universal dynamical structure of the scope indicated. Then, since reductionism does not work even within physics, we would get an effective or 'generalised' dualism of mind and nature, one moreover according to which they are still constantly related by causal connections of similar kinds to those already discovered in the sciences. Mind and nature, without being reduced to the other, would be both part of a more complicated structure that the scientists have already begun to investigate in detail even though they have not yet seen the whole picture.