RELATIONAL SYSTEMS
- Annotated Outline -

I. PRESUMPTIVE FOUNDATIONS

Experientially Specific:
Personal Experience is the Existence of **RELATIONAL SYSTEM (RS).**

Symbolically General:
*By Presumption, **RS** is the Essence of Existence (Non-Existence) other than Personal*

General Presumptions:
SS (Relational Order 1 or R01)-MonoRelational;
SR (Relational Order 2 or R02)-BiRelational;
RR (Relational Order 3 or R03)-TriRelational; and
R(S)-NESS (Relational Order 0 or R00)-SelfRelational

Specific Presumptions:
IaR(Inter (actional) Relation) of ***I***(Image) and/or ***S***(SubSumption)

Philosophical Assumptions
Existence – Cosmos
from
Existence (Non-Existence) - Cosmichaos

Symbolically Specific:
Philosophical Notions
S(Totality or Whole)/Field/Energy-Information
sS (Component or Part)/Particle/Atom (with 2 characteristics)
(**sS** corresponds to subSystem)
IaR of **S**'s and **sS**'s through ***I*** &/or ***S*** in **SS**, **SR**, **RR**, or **R(S)-NESS**
Systemic Reality is Paradoxical;
Non-Paradoxical Reality is Relational;
R(S)-NESS IS Non-Paradoxical

Formal Notions
Mathematical: Multi – ***I*** &/or ***S*** in **RS**
Logical: Multi – ***IaR***

Theoretical Notions

Systemantilectical Resolutions of Systemantic Paradoxes implies a Taxonomy of Levels (…Formalons, Nuclons, Chemons, Bions, Psychons, Socions, Autonons,…)

Optimum Sytemic (subSystemic) Probability Inference (OS(sS)PI)

<u>Experientially General:</u>

System - as - Totality

R01 is sufficient

System - as - Whole

R03 is necessary since a **Whole** is not a **S** (no-thing)

Field is **Wholing R** of **R**'s

Field is Formalized as Max Order of **R**'s (via OS(sS)PI)

Particles are Holographic

II. GENERAL RELATIONAL THEORY CONSTRUCTION

A) Specific Relations Subsumed by the Presumptions of Relational Philosophy

- 1) Image Relations
  - a) Symbolic (Image) System
    - i) Formal (Symbolic) System (FS)
      - aa. <u>Specify</u> primitive **S**'s and **R**'s
      - bb. <u>Define</u> how **RS**'s should be constructed from primitive **S**'s & **R**'s
      - cc. <u>Presume</u> certain primitive **RS**'s (axioms; postulates)
      - dd. <u>Specify ***IaR***</u> (rules of inference) stating conditionally how other **RS**'s (theorems) are to be derived from the primitive **RS**'s.
      - ee. <u>Certain **RS**'s</u> shown to be explicit **RS**'s derivable by <u>***IaR***</u> from the primitive **RS**'s
      - ff. <u>Meta-**RS**'s</u> about the FS itself which relate certain of its parts in specified ways
    - ii) Theory (of Experience)
    - iii) (Natural) Language
- 2) Order-Disorder Relations
  - a) Hierarchical/Heterarchical System
- 3) Real (-Unreal)/Actual (-Possible) Relations

B) Minimal Hierarchical/Heterarchical Theory

- 1) Order Relations

2) Order Decision Relations
3) Disorder Relations
4) Disorder Decision Relations
5) Symbolic Actional Relations (Relations to Experience)

C) Minimal "Spatial-Temporal" Hierarchical/Heterarchical Theory
1) Order (Deterministic) Relations
a) Deterministic Kinematics
b) Deterministic Dynamics
2) Initial Order Decision Relations
3) Order-Disorder (Probabilistic) Relations
a) Subsystemic Probabilities
i) Probabilistic Kinematics
ii) Probabilistic Dynamics
b) Systemic Probabilities
i) Probabilistic Kinematics
aa) Including Entropy (Information)
ii) Probabilistic Dynamics
aa) Including Time Evolution of the Entropy
4) Initial Disorder Decision Relations
5) Symbolic Actional Relations (Relations to Experience {Correspondence rules})

III. A SPECIFIC EXAMPLE OF RELATIONAL THEORY CONSTRUCTION

A) Order (Deterministic) Relations
1) Kinematical Relations: Represented by a Boolean algebra for classical systems and quantum lattice for quantum systems.
2) Dynamical Relations: Represented, eg by Newtonion or Hamiltonian equations of motion for classical systems and by the Schroedinger (or Hiesenberg or other analogous) equation for quantum systems. It should be noted that these deterministic spatial-temporal Relations can be given experientially or formally by an additional decision (variational) process.

B) Initial Order Decision Relations
Taken as heuristic choices of the initial spatial-temporal relations.

C) Order-Disorder (Probabilistic) Relations
1) Subsystemic Probabilities: Taken as “ordinary” probabilities.
a) Kinematical Relations: Represented by classical (Cox) probability theory for both classical and restrictively quantum

systems; the still unresolved problem of the explicit nature of quantum probability is thereby circumvented.

b) Dynamical Relations: Represented by the Liouville equation for classical systems and the Pauli equation for quantum systems

i) Construction

aa) Experiential Construction

bb) Formal Construction

1 -1) Deterministic Extension; via the imposition of the deterministic dynamics on the probabilistic kinematics

2-2) Variatonal Construction:

aaa) Direct; Maximization of the systemic probability (over a time interval) with respect to the appropriate subsystemic probabilities

bbb) Indirect: Maximization of the systemic probability (over a time interval) via the extremization of the subsumed "Lagrangian" with respect to the appropriate subsystemic probabilities

ii) Resolution

aa) Direct

bb) Variational Procedures: Use of Optimum Systemic (subSystemic) Probability Inference (OS(sS)PI) in either exact (analytic) or approximate, complete or partial, resolution processes, eg in the analysis of

1-1) Stationarity, and

2-2) Stability under a perturbation.

2) Systemic Probability. Taken as the Cox information (entropy) function.

a) Kinematical Relations: Represented by Cox information theory for both classical and (again restrictively) quantum systems; the problem of the nature of the quantum mechanical entropy is also thereby circumvented

b) Dynamical Relations: Taken as the evolution equation for the entropy

D) Initial Disorder (Probabilistic) Decision Relations (OS(sS)PI)

Choose those subsystemic probabilities which maximize the systemic probability (e.g. entropy) at a selected time point subject to all given relational constraints

E) Relations to Experience

1) Order Relations: Direct Correspondence
2) Disorder Relations: Correspondence via an expected value formalism