PRAGMATIC RELATIVITY*

In process

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Abstract

Do:- finish it ... The name "Quantum Mechanics" carries the germ of mechanistic philosophy. Many people endure to fit quantum theory into this name. They seem to work on causal interpretation of quantum theory. Practical quantum theory is not mechanistic. We can not reduce an individual quantum system to finite and coherent set of quantitative entities, that define its qualitative infinity [1]. A mechanistic theory suffices this requisite. The doctrine with name "Quantum Mechanics" entails mechanistic prescription that gives rise to paradoxes, arising from experiments that are incompatible with mechanistic prescription. We change the prescription to avoid paradoxes, which seems neater way to reduce ambiguity. Our prescription is pragmatic, bimodal and non-mechanistic, where paradoxes seem obvious. I call a practical quantum theory "Pragmatic Relativity", for its syntax is pragmatic, and it relativizes absolute "states-of-being".

keywords Pragmatic Logic; *a posteriorism*; Quantization; Praxism; *a fortiorism*; Relativization; Flexing.

PACS Do:- include ...

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*Dedicated to seminal ideas of Bohm and Finkelstein.

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1 Premise

Physics is perception of nature. It might be operational, as long as fundamental entities in nature are operations. Pragmatics (Greek root to process or operation) has ancient roots. Classical theory was pragmatic too; though operationality was mental or mathematical. Quantization brought pragmatics into physical semantics. Parmenides discarded *doxa* (*episteme* arrived at by perception or measurement) over *logos* (*episteme* arrived at by reason) as approximate knowledge. Heisenberg entailed *doxa* as actual knowledge.

2 Pragmatic Darwinism

Theory is perspective — a way of looking at something — not knowledge about 'it'. Theory derives from Greek *theoria* having same root as theater in the sense of etymology. No theory can be constructed without an *absolute* as no theater can be constructed without an *Idol* in Baconian sense. This Idoloclasty makes theory based not entirely on experiment. An Idol is incorporated to facilitate calculations within theory that corrupts it as well.

Relativization replaces one Idol with another. A theory without Idol, that may be based entirely on experiment seems a super-relativistic-theory. It would be similar to making a castle without ground. Ground is a misnomer that results due to vast condensation of the Earth. It is a false absolute. [A Castle on ground is a non-pragmatic entity then.]

Physical theories have Darwinian selection for simple and stable algebras as Segal proposed. Quantization and Relativization simplify and stabilize theories. It results in a simple theory that agrees better with experiment. A theory based on experiment is pragmatic theory, which is praxiological, not ontological.

Pragmatization is a more generic process [of theory evolution], that makes theories more relativistic, more atomistic, more finite and to agree better with experiment. All physical theories today need syntactic revision in this sense. They need praxiological corrections in Finkelsteinian sense, that make theories more pragmatic.

3 Pragmatic Logic

Every (new) physical theory introduces radical revision in logic, mode of physical thinking. Classical logic was objective logic, where objects were fundamental entities. C(lassical) logic was full of Idols, false absolutes. Relativization continues to eliminate these Idols. Quantization entails *operations* more fundamental than *objects*, and introduces order-dependent logic.

Quantization and Relativization replace C logic with P(ragmatic) logic. This elimination is a process, that would continue. The selection is Darwinian. To survive better, theories must be more pragmatic, based on perception rather than faith. The drift is anti-ontologistic.

4 Beyond Mechanism

Mechanism is search for the *Law of Nature*. The fundamental entity theorized in mechanistic philosophy is the *sole variable*, that changes from level-to-level. Thus, we can never have a mechanistic theory of physics pragmatically. We can approximate the *entity variable* to be fixed at some level, and develop a mechanistic attitude at that level, towards the physical theory. But it results in Idoloclasty. It results in an approximate theory to a deeper, more fundamental one, which is non-mechanistic too.

We ought to theorize perception of nature, phenomenologically, rather than philosophizing idealistic features like that of mechanistic one. A purely mechanistic theory seems, pragmatically, later day equivalent to *philosopher's stone*.

Usual (acausal) quantum theory along with its causal BBB (Bohm-Broglie-Bell) semantics is hodge-podge classical-quantum [cq] theory. It is based on residual mechanistic philosophy, vestige of classical strategy. Quantum theories need non-mechanistic reformulation. Current form of quantum theory is mechanistic, however, *provisional* [cf. Bohm]. Quantum mechanics emerges as deformation of classical mechanics [cf. Flato]. Our program is to *reform*, not to *deform* [cf. Finkelstein].

Reformation of quantum theory demands radical rethinking. Provisional quantum theory (or Quantum Mechanics) has mechanistic form because it theorizes mechanistic 'objective' variables. Reformation entails radically new variables; praxiological and non-mechanistic.

5 Finitism

DO: `... Heuristic!`

5.1 Finite Logic

Zero and Infinity are ambiguous. They have *order*, but not *measure* (or have ambiguous measure) to be subjected to constitute *structure*. These are platonic realities, which could not be subjected to physical perception.

Finite structures have *upper* and *lower* bounds. Physical theories may be based on finite-logic to dispense with ambiguities.

5.2 Semi-Finitism

Aristotlean space was semi-finite: a convergent (finite) space with infinite divisibility. Atomized Aristotlean space may be finite.

DO: ... Heuristic!

5.3 Finite Physics

Physical theories evolve as long as physical theorist evolves. Theories evolve from *singular, divergent, commutative, continuous, non-local, non-generic, unstable, fragile* to *regular, convergent, non-commutative, atomized, local, generic, stable* and *robust* ones. This process of theory evolution was termed *regularization*. A regular theory has lower mortality rate than its singular limit, that it evolves from. Regular theories have *simple* Lie algebras. Algebraic simplification regularizes some singular theories. This heuristic principle is due to Irving Segal, who regularized Heisenberg algebra $H(1)$ to Segal algebra $SO(1,2)$ by simplifying it. Simple Lie algebras have *finite* dimensional representations. Algebraic simplification can finitize some divergent theories that pervade physics today. Simple (and semi-simple) algebras have *trivial deformations*; deforming it results in *isomorphic* ones. Algebras with trivial deformations are termed *robust*. Regular theories have *robust* algebras, which are *finite*.

I entail *finitism* as guiding principle in this heuristic quest. A finite theory has upper and lower bounds for *actions* (or a construct within theory). Special relativity has upper bound (c) for an action (or propagation). Quantum theory has lower bound (h) for an action. Both theories entail a (semi) finite construct. Special relativity relativized *"time"*. Quantum theory relativized *"states of being"*. Former is a relational (ontic) theory; later is operational (pragmatic). A synthesization of these two would have *semantic error*. I do not synthesize theories. I look for better ones than those survived.

Finitization by *algebraic simplification* can relativize and quantize absolutistic physical theories. Physics may be *finite*; with finite actions, finite predictions, finite precision and finite results.

6 Quantization

DO: ... Heuristic!

6.1 Quantization as Finitization

Quantum theory is a bi-product of Planck's *trick* to finitize divergent heat capacity of the oven. Unfortunately, Planck's original finitization program was erroneously taken as atomization. Heisenberg found quantization as non-commutativity, Jordan as non-associativity, Schrödinger as eigenvalue problem, and Bohr as complementarity. All such approaches led to divergencies in field theoretic regime. Segal (1951) [2] seems to be first to retain Planck's original finitization program. Supersymmetry (SUSY), strings, and Haag's algebraic quantum field theory (AQFT) tend to be further finitization programs.

7 Relativization

DO: ... Heuristic!

8 Pragmatization

Pragmatization is a theory-revision-process, entailing theories more actual, than real. This process revises fundamental logic. It entails *processes* more fundamental than *objects*. Then predicates are *acts*, not *things*. Theories modeled on processual predicates are pragmatic (actual).

Pragmatization carries a theory from *Ontic semantics* to *Pragmatic semantics*. An archetypical example of this revolution is *Caloric theory* (ontic, relational) that evolved into *Kinetic theory* (pragmatic, operational). There are symptoms that quantum theory is relativization of kinetic theory, by renouncing the absolute "being". For this reason I call quantum theory "Pragmatic Relativity" (or Operational Relativity) and Einsteinian theories, "Ontic Relativity" (or Relational Relativity).

A relational theory can be mechanistic, operational can not. "Quantum Mechanics" is misnomer in this sense; a false nomenclature. The right one seems to be "Pragmatic Relativity".

9 Pragmatization as Quantization

DO: ... Finish this section!

9.1 Pragmatic Irreversibility (Quantum Spontaneity)

DO: ... Heuristic!

9.2 Heisenberg's Relativism

DO: ... Finish this section!

Heisenberg relativized *absolute objects* to *relative acts*.

9.3 Pragmatic Relativity

DO: ... Heuristic!

9.4 Quantum Grammar

Quantum theory advances tense structure: how *subject*, *verb* and *object* combine. Heisenberg relativized *object* and renounced *split* between *verb* and *object* and unified them to *verb-object*, as Einstein relativized *time* and unified *space* and *time* to *space-time*. In usual quantum experiments, an experimenter (*subject*) changes the *system-under-study* it perceives, but is not changed itself in reaction. We entail the *same* experimenter throught entire experiment. Experimenter *acts* but does not *react*. This *non-reciprocity* entails a bundle

$$verb - object / subject\,,$$

of *verb-object* fibre and *subject* base.

This structure is core of Copenhagen theories. Bohr called relativization of *subject* "*painful renunciation*". Our program is to relativize *subject* and unify it with *verb-object* to form

$$subject - verb - object\,.$$

Theories modeled on this grammar are post-Copenhagen theories.

9.5 Post-Copenhagen theories

DO: ... Heuristic!

Rovelli (1996) [3] relativizes the observer, and extends quantum theory to meta-meta-...-observers. He relativizes states-of-being, but not experimenter's frame. Relational quantum theory is "State Relativity", not "Frame Relativity" of Dirac [4]. Rovelli seems to theorize dogmatic variant of post-Copenhagen quantum theory. Our program is to pragmatize it.

10 Pragmatization as Relativization

DO: ... Finish this section!

10.1 Relativistic Irreversibility (Relativistic Spontaneity)

DO: ... Heuristic!

Non-commutativity of "Boosts"

[Quantization and relativization are instances of more fundamental process "pragmatization".]

11 Pragmatic Ether

Space-time points have pervaded physics since the time of Aristotle. Physical theories entail Ether as Idol in the sense of reification. Present physical theories are based on absolute and local vacuum that forms local bundle structure

$$System/Vacuum\,,$$

where '/' reserves *non-reciprocity* between S (System) and V (Vacuum), entailing V as absolute. Theories need to be quantized (non-localized) and relativized, as pragmatization implies. This could be accomplished by eliminating *Vacuum Idol*, and atomizing space-time. It results in a non-local structure where reciprocity exists,

$$System - \mathrm{q}Vacuum\,,$$

where hyphen '−' reserves *reciprocity* between S (System) and qV (Quantum Vacuum), rendering *S*-qV as sole variable. □

12 Pragmatic "Event"

Einstein's event is ontological — space-time *address* of happening — not happening itself. Address is *noun*; happening is *verb*. It infests Einsteinian theory, which is not based entirely

on experiment, and renders it singular. Pragmatization regularizes Einsteinian Relativity, by making praxiological corrections to "event".

Operationality of space-time was tacitly suggested by Rui Vilela-Mendes in his non-commutative space-time framework, which emerged as regularization of Poincaé-Heisenberg algebra.

13 Flexing, Deformation and Pragmatization

Pragmatization flexes geometry of physical groups. Flexing is more generic process than deformation. Deformation regularizes theories, but does not eliminate *absolutes* and *radicals*. Flexing does. It results in a theory based entirely on experiment, which is pragmatic.

Non-locality and order dependence (Non-commutativity; non-associativity) result in flexing.

14 Finitization as Pragmatization

Pragmatizing systemic predicates invites their quantization and relativization. Quantization or atomization sets a *lower bound* to systemic predicates. Relativization converges divergencies in systemic predicates, and sets their *upper bound*. Dully bounded systemic predicates form more physical theories, and are represented by simple lie algebras with finite dimensional representations. Pragmatization finitizes divergent physical theories. Quantization is somewhat deeper pragmatization than relativization.

DO: `... Heuristic!`

References

[1] David Bohm. *Causality and Chance in Modern Physics*. Routledge and Kegan Paul, London, 1957.

[2] I.E. Segal. A class of operator algebras which are determined by groups. *Duke Mathematical Journal*, 18:221–265, 1951.

[3] Carlo Rovelli. Relational quantum mechanics. *Int. J. Theor. Phys.*, 35(8), 1996. arXiv: quant-ph/9609002v2.

[4] P.A.M. Dirac. The physical interpretation of the quantum dynamics. *Proceedings of the Royal Society of London A*, 113(765):621, 1927.