

**CRITICAL REMARKS ON
K.V. LAURIKAINEN'S
NATURAL PHILOSOPHY**

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11.11.2013

LAURIKAINEN' S THREE MISSIONS

- K.V. LAURIKAINEN (1916-97)
- Ph.D. in physics, University of Helsinki, 1950
 - Professor of Nuclear Physics 1960-78
 - Professor of Particle Physics 1978-79
- Research Institute for Theoretical Physics 1964
- experimental particle physics
 - co-operation with CERN in 1965
 - Finland joins CERN 1991
 - Helsinki Institute of Physics (HIP) 1996
- Finnish Society for Natural Philosophy 1988
 - History and Philosophy of Science
 - science and religion

PUBLICATIONS

- Atomistiikan aatemaailma [Ideas of Atomistic] 1973
- Fysiikka ja usko [Physics and Belief] 1978
- Todellisuus ja elämä [Reality and Life] 1980
- Quantum Theory and the Openness of the Scientific World View 1980
- Luonto puhuu luojastaan [Nature speaks about Its Creator] 1983
- Tieteen giljotiini [The Guillotine of Science] 1987
- Beyond the Atom: The Physical Thought of Wolfgang Pauli 1988
- Atomien viesti [The Message of Atoms] 1994
- Science has its Limits: Ontological Implications of Quantum Theory 1997

NATURAL PHILOSOPHY

- Pre-Socratic Greek philosophy of nature: DEMOCRITUS, HERACLITUS, EMPEDOCLES
- metaphysics: PLATO, ARISTOTLE
- modern physics: GALILEO, BOYLE, NEWTON
- *Naturphilosophie* in German idealism: GOETHE, SCHELLING, HEGEL
- general philosophy of science:
 - THE VIENNA CIRCLE, SCHLICK, REICHENBACH, CARNAP
 - co-operation with physicists: MACH, BOLTZMANN, EINSTEIN, BOHR, HEISENBERG
- philosophy of physics, chemistry, and biology

KAILA' S INFLUENCE ON KVL

- student of ROLF NEVANLINNA in mathematics 1934-
- Laurikainen followed EINO KAILA' s philosophical lectures on logical empiricism in 1938, notes:
Inhimillinen tieto (1939), laudatur examination 1940
- Kaila' s project: world view based on the critical study of best current theories:
 - QM, relativity theory, evolution, Gestalt psychology
 - Kaila speaks about *Naturphilosophie* still in 1958
- two papers by KVL in *Ajatus*:
 - ”Matematiikan analyyttisyydestä” (1941)
 - ”Minkowskin neliulotteisesta maailmankuvasta” (1942)
- no comments on Kaila' s philosophical studies in QM

KVL ON QM

- Copenhagen interpretation of QM
 - BOHR, HEISENBERG, PAULI
- epistemic uncertainty interpretation of the psi-function
- measurement disturbs atomic objects
- against hidden variables
- double slit experiment: complementarity, statistical causality, quantum indeterminism

COMMENTS

- realist interpretations of QM without hidden variables
 - POPPER: psi-function and propensities, indeterminism
 - BOHM: holism, particles with a definite position and determinate trajectory, associated wave
 - KAILA: terminal causality (cf. STÖLTZNER)
 - HEALEY: interactive properties, interactions not restricted to observations or measurements
- QM does not support the idealist view that the micro-world is mind-dependent
- cf. my *Critical Scientific Realism* (1999)

NATURAL THEOLOGY

- HUME, KANT: rejection of teleological proof of God's existence
- PALEY: *Natural Theology* 1802
 - the argument from design
- DARWIN: theory of evolution refutes the design argument
- creationism
 - information, complexity, improbability
- intellectual design (ID) creationists

KVL ON RELIGION

- Laurikainen rejected in 1980 the U.S. creationist campaign to use the *Bible* as a textbook of science
- however, he argued for the compatibility of science and religion
- but in 1981 he protested against the teaching of the Big Bang in schools
- faith or personal religious experience reveals the existence of an "irrational factor" or "free will" in reality, admits God's providence, against materialism
- nature speaks about its creator
- statistical causality, neglected by philosophers, opens the way for mysticism in natural science
- D' ESPAGNAT: veiled reality – veil between the rational (empirical) and irrational reality

COMMENTS ON KVL

- OIVA KETONEN on KVL in 1976: to appeal to the Creator as the cause of existence is to "explain the unexplained by the unexplained"
- to KVL's disappointment, physicists were not impressed
- Lutheran theologians, who support the peaceful independence of science and religion, indifferent to KVL

MY DEBATES WITH KVL

- Laurikainen's Thursday seminar, later seminars of the Finnish Society for Natural Philosophy
- open letters and articles in *Vartija*, *Kanava*, and *Tiedepolitiikka* in 1980-84
- my summary in *Filosofia, tiede ja maailmankatsomus* (1984): "Laws of Quantum Mechanics do not Presuppose God"

AGAINST KVL' S ARGUMENT

- Common premise: scientific indeterminism
 - particular events are governed by probabilistic laws, so that they do not have complete determining causes
- Laurikainen' s jump to the conclusion that particular events involve an additional supernatural irrational cause ("free will", "chance"), which guides the world events, is based on a kind of metaphysical determinism, "only God knows what happens in particular cases"
- from nothingness (non-existence of determining causes) one cannot infer the existence of God' s guidance or an irrational factor unknown to science

FURTHER DISCUSSIONS

- my review of K.V. LAURIKAINEN & KULLERVO RAINIO:
Todellisuus ja kuvajainen (1990)
- Rainio is a pioneer of applying stochastic models in social psychology
- for him, KVL' s irrational = stochastic
- KVL misleads Rainio to speak about the "free choices" of particles
- KVL ignores laws of large numbers in probability theory
- unclear positions in the psycho-physical problem
- how could quantum indeterminism prove that I have a free will?

RAINIO 2010

- in *Vartija* a good summary of my debates with KVL
- KVL could avoid metaphysical determinism by admitting that the "irrational factor" effects *some* single events *sometimes*
- but then Rainio refers to KVL's statement that "God is present here and now", and "in his hand is everything that happens"
- Rainio concludes that our scientific world view has to take seriously the ideas of "active information" and "information field" – so back to BOHM!?