

Sunday, June 18, 2000

Teleological Bohm Quantum Non-Mechanics

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Abstract

Bohm's causal interpretation of orthodox quantum theory is extended to fit the Aharonov two-state model in which both the past and the future determine what actually happens in the present in accord with [Sir Fred Hoyle's theory](#). Experimental evidence by Dean Radin and the Russians is cited to support this idea.

I start from Eyal Gruss's master's thesis under Aharonov at the Hebrew University.¹

$$p(a_k, t | \Psi_i, \Psi_f) = \frac{p(\Psi_f(t) | a_k) p(a_k | \Psi_i(t))}{\sum_j p(\Psi_f(t) | a_j) p(a_j | \Psi_i(t))} \quad (1.1)$$

This is the intensity of the Bohm pilot quantum information field in the representation of eigenfunctions of some observable Hermitian operator denoted by A whose eigenvalues are a_k . Ψ_f is the final teleological destiny vector in the future, Ψ_i is the initial history vector of the orthodox theory. The Born probability interpretation for "subquantum heat death"² need not be assumed. What I do here goes far beyond Gruss's thesis, which is limited to orthodox signal-locality, but was triggered by it.³ For an N point particle state, choose A to be the position operator in 3N dimensional configuration space in Galilean relativity when $v/c \ll 1$. Therefore,

$$a_k \rightarrow x = (x_1, y_1, z_1, \dots, x_N, y_N, z_N) \quad (1.2)$$

¹ <http://xxx.lanl.gov/abs/quant-ph/0006070>

² "Pilot-Wave Theory of Fields, Gravitation and Cosmology, Antony Valentini, p.45, Boston Studies in the Philosophy of Science, Vol 184 (Kluwer, ISBN 0-7923-4028-0, 1996) "the quantum theoretical distribution

$p = |\Psi|^2$ is not fundamental. It is merely an equilibrium state ... *nonlocal connections between distant entangled systems lead to practical instantaneous signals, at the statistical level, if and only if $p \neq |\Psi|^2$...*

the equilibrium $p = |\Psi|^2$ may then be seen as a kind of 'subquantum heat death'. In which the underlying nonlocal connections may no longer be used for practical signalling. (In the classical heat death, thermal energy may no longer be used to do work.)

³ Thanks to Gary Bakkum for alerting me to Gruss's thesis.

Define

$$R(x,t) = \sqrt{p(x,t | \Psi_i, \Psi_f)} \quad (1.3)$$

The many-particle Bohm quantum potential in configuration space⁴ is then obviously

$$Q(x,t | \Psi_f, \Psi_i) = -\frac{\hbar^2}{2m} \frac{\sum_{j=1}^N \nabla_j^2 R(x,t)}{R(x,t)} \quad (1.4)$$

Experimental evidence exists to support this model of reality.⁵

⁴ Some people claim to be able to eliminate configuration space in quantum theory. The burden of formal proof is on them and to my knowledge the claim is not justified.

⁵ <http://www.boundaryinstitute.org/articles/Radin-Esalen.htm> and <http://ufn.ioc.ac.ru/abstracts/abst98/abst9810.html#d>