PRECOGNITION AND THE 'BASIC MATERIALIST FANTASY'

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The paper entitled "Physics, Philosophy and Precognition", by John L. Randall (*JSPR,* October 1998), as a survey of unsuccessful theories of precognition, is to that extent very creditable. I have however two very serious criticisms to make in regard to the author's "reflections".

One is that his insistence on an alleged incompatibility (or 'clash') between the Relativity and Quantum Theories echoes an unfortunate but fundamental misconception of the mathematics and phenomenology of the various forms taken by these theories. The other is that, although research papers published as late as 1996 are referred to, not the least reference is made to my phenomenological (firsthand experiential and analytical) paper of 1995, in which the various mental faculties concerned with what we call 'time' are shown as compatible with the new physics, and also with there being a 'script' for the later exercise of a limited 'free will'. Since this has been explained at length in my paper, what is suitably attempted here will be little more than an outlining of the phenomenological implications of these theories of advanced mathematical physics (so often misrepresented popularly).

Relativity theory presents two kinds of *measurement tool* ('geometries') that we can try to apply to laboratory or astronomical observations. The Special theory can be shown (by Group Theory) to be logically necessary when a set of observers communicate but must be able to agree somehow on what they measure—not only among themselves, but also with another set in relative motion to them. There has to be some standard means of communication (light in empty space), and 'standard clocks' (with isotropic time measures), correlated so that, first of all, different observers in the one set can agree on a 'cosmic time' for any event and its 'distance' from each of the two observers. Note that we cannot begin with supposed variations in a 'velocity of light' before any measuring system has been set up; so, inevitably, in this original system of measurement, the 'velocity' of communication (*defined* as distance/time-lapse in communication) turns out to be the same for all observers of the set.

If we now wish to apply this 'geometry' to *another* set of observers moving relative to the first, or to extend it to a non-uniform field, a new geometry must be devised, so that the measures of any given event by all observers are reconciled.

If we still deal with the absolute uniformity of empty space, the transformation from measures of the one set (called an 'inertial frame') to those of another naturally involves changes in both space and time measures, The result is the Special Theory for 'flat space-time'. It is essential to note that no such geometry is 'read off' from observations. We choose the simplest logically consistent geometry, with which we can and must begin locally, and then try to apply it in cases where in fact it may not prove workable.

The General Theory covers three kinds of attempt to extend the measuring system of the Special Theory to a universe which is not 'flat'. This is done

by formalizing the geometry in terms of a 'metric' (as in the geometry of non-plane surfaces). We can then consider (1) a single point singularity, which provides a formalism for changes around the sun; (2) effects of non-flatness uniformly filling all space (which gives 'spherical' and other uniform geometries); or (3) adopting the 'metric' for a homogeneous universe, and then arguing about what might happen if the universe had countless irregularities. In principle, however, there can be no *logical and consistent geometry* for the actual universe. For we would have to locate and measure the irregularities prior to constructing the metric which enables us to measure them (see the quotations in my *Philosophy of Space and Time,* pp.93f, 161). So "a space that can serve as 'form of phenomena' is necessarily homogeneous" (Weyl, 1949, p.86).

It might be thought that we could just sit in our observatory and record Euclidean measurements and clock times. But that is pure solipsism. We would not find reasonable agreement even between what is observed astronomically in January and what is so observed in July (the velocity of the earth differs then by about 60 km per second).

The concept of measurement therefore breaks down as we attempt to deal with the immensely great. And similarly, as we shall see, it breaks down as we approach the infinitesimally small; but there are also other troubles then, making the whole concept of exact measures in the physical world illusory.

'Quantum Theory' is a term that covers a vast field of mathematical attempts to produce a 'measurement tool' able to explain the very numerous small-scale effects which cannot be explained, and are in fact contradicted, by classical mechanics. These include: line spectra, interference and diffraction effects, the photoelectric effect, the Compton Effect, phenomena of radiation, etc. The main difficulty is that an extended wave-structure is needed as cause, even when it is particle-like effects that are observed on the given occasion. But such wave-cause cannot be located in *physical* space, where it would then have to collapse instantly. On this and other grounds, one must conclude that the wave that we picture is only a *conceptual component* in a complex non-physical selection mechanism for pointlike manifestation. We say it is *unobservable.*

It follows that the only way to settle the mathematical form of the 'wave function' in any experiment is to have a logically consistent mathematical theory and find some function that gives the right results. But another difficulty then emerges (as Heisenberg showed), that if we accept that the radiation and line spectra anomalies are rightly explained by energy being transferable only in 'packets' (of size $h\nu$), exact measures for the position and the velocity of a point-particle cannot *both* be determined. So the theory should normally produce only 'expectation values'. And in particular, the classical point-particle is a myth.

Passing over the patchwork of postulates in the 'Old Quantum Theory' and the more far-reaching patchwork in 'Elementary Quantum Mechanics' as usually presented, we come to two consistent mathematical formalisms, analogous to the classical techniques for deducing the sharply defined 'harmonics' (audible) in the vibrations of a stretched string or membrane. An astonishing fact emerges, that when the formalism of 'linear operators',

standing for measuring procedures, operating on wave-functions in 'Hilbert Space', is developed with a 'momentum representation', one can deduce the classical Hamiltonian equations of motion for *expectation values,* systems of discrete values (like harmonics), and, more generally, the uncertainty relations. It seems that all this is somehow on the right track for microscopic and sub-microscopic phenomena.

But there are enormous deficiencies, notably in electromagnetic theory and interaction between fields. The worst of these are coped with by the formalism of Quantum Field Theory (on analogy with *continuous* Hamiltonian theory for a stretched membrane). Astonishingly then, it appears that the uncertainty goes along with quantization of the field, certain operators being able to add or subtract quanta in the field upon interaction with another field. But the problems that can be 'solved' are very few (though amazingly impressive). And the abstruseness of the mathematics suggests that these theories are largely mathematical artefacts, corresponding to the actual causes in nature only in an incomplete metaphorical way. The conclusions remain, however: (1) Physics ignores the prime essential in any physical *observation* — contributions in regard to the observer's circumstances, skills and state of mind at the time (this partly accounts for the uncertainty). (2) It also replaces the actual 'boundary conditions' by simplified mathematical forms (because perfect straight lines, etc. do not exist in nature. (3) A geometry of *exact location* for the physical universe, whether in what is very great or what is very small, is *logically* impossible. There is thus no geometry that can cope with all the factors involved in physical observation.

There is a fundamental bearing of all this on parapsychology. For opposition to the evidence presented in psychical research almost always seems to arise from the presupposition that the only 'reality' is what is precisely located in a presupposed unique Euclidean space and clock time of this physical world. That supposition is what I suggest calling the Basic Materialist Fantasy (BMF). For the developments in physics have shown that there is a vast and indescribably complex causal world behind the shell of physical phenomena, relating to both individual minds and more general supra-physical powers.

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