

Materiality: Is It Real?

Paul Merenski (December 2014)

. . . Space is completely filled by the field that defines its metrics; what we have hitherto called material bodies are only condensations of this field. It makes no sense to speak of a movement of material parts as a transport of things; what takes place is a traveling process of condensation comparable to the movement of a wave in water. ~ Reichenbach

Mass is what comprises matter. It is the flip side of the energy manifestation of field. Its popularity as the basis of our material reality is the result of man's practical nature. Physics is concerned with physical phenomena for which it is necessary to have practical explanations. Every physical substance has mass, or its essential existence. Its mass is what is pushed, pulled, spun, or just allowed to lie there, in terms of the practical aspects of our reality. It is an excellent "measurable" abstraction for use in the mathematical models of our world.

Mass is a first approximation. The empirical nature of science requires that theories be supported by experimental observations. The methodology for measuring and assigning the characteristic of mass to "particles" requires a significant quantity of substance before it will register as possessing mass. This is an empirical limitation of the term and has no other justification.

Our inability to refine the method for measuring mass required that we create a new term, quanta, to describe the smaller localizations of energy that we were encountering. Mass and quanta ("particles") are interchangeable terms in their reference to the characteristic we are considering. They are both cohesive localized energy events within the overall fabric of the universe. They merely describe different "amounts" of the same phenomenon and one of those amounts, a quantum, is not measurable as mass with current technology.

The intricacies of energy, inertial mass and momentum as manifestations of the unified quantum field are too complex for the purposes of this discussion. But the most revolutionary aspect of quantum mechanics has been variously ignored or vigorously denied depending on the author's particular preference — the fact that the existence of "particles" is no longer supportable. DeBroglie attributed a vibratory nature to matter and Planck assigned a corpuscular character to radiation. Einstein's and Planck's equations have been found valid in virtually every physical arena. $E=hf$ and $E=MC^2$ together reveal the composition and characteristics of energy/mass/momentum ($MC^2=hf$) that comprises our reality ...and it is not material except in the way we experience it.

The Rayleigh principle unambiguously states,

. . . an individual 'particle' is a whole train of waves of different frequencies which together form a wave packet. The velocity of these packets is a function of the waves comprising it.

All energy/mass is vibratory and Bachelard suggests the crucial connection with Time that our "measurements" mandate,

*... From criticism delivered by wave mechanics, it follows that **the particle has no more reality than the composition that manifests it. There are temporal events at the very foundation of its existence.***

But it is Eddington who points out the fundamental conundrum of objective indeterminacy,

*... to recognize h (Planck's constant) is to deny subjective indeterminacy and accept objective indeterminacy ... The suggestion is that an association of exact position with exact momentum can never be discovered by us **because there is no such thing in Nature.***

A material particle thus loses its character of a substantial entity existing in space and enduring through time. It is revealed as simply that which we identify when we perform a particular process event in Time called

“measurement”, or observation. Particles are what comprise the atoms that we consider the building blocks of our material world. If particles are not substantial entities existing in space and enduring through time ... what does that say about the atoms made from them that comprise our material reality?

As I have shown, quantum mechanics provides the frame of reference for the stratification of energy substance by frequency. The frequency is determined by the wavelength. The shorter the wavelength the higher the frequency and, thus, the faster it vibrates. At the heart of the quantum theory of atom formation is the mathematically expressible phenomenon of the standing wave. A standing wave pattern is permanent for any frequency, despite the transience of the propagated waves that comprise its becoming.

An atom is merely a gathering of smaller localized energy events in the form of waves that gather together and act like separate particles that have mass. Our scientists have named these localizations protons, electrons and neutrons. They are comprised of waves of energy at differing frequencies. Particle physicists are obsessed with finding ever-smaller localizations by “smashing” them in particle accelerators, hoping to find the smallest, most fundamental “particle”. They have discovered and named many such “particles”. Their most recent triumph is the Higgs boson. (I liken their efforts to throwing a Swiss watch against the wall and then naming all the events and their direction of spin, up, down, color, etc. etc.)

prefer to analogize the wave nature of reality to the surf of coastal areas. It is a localization of the ocean into swells that have “mass”. Any surfer who has been wiped out by one of these localizations knows that they act like separate, quite solid, and massive particles of the basic ocean. The individual wave disappears in the act of accomplishing its experiential effects but the surf remains. Understanding the nature of pulsational becoming and the spherical standing wave patterns that underlie the permanence of existence will be easier if you futilely try to describe the nature of the wave without referring to it as the “one that wiped me out”. The individuality of such elements is in the separateness of events, not things. Existential permanence is in the reiteration of events through time, not the existence of “particles” or material through Time.