Bruce DePalma 18 July 1995

That is Science

It is well known that geometrical optics is a mathematical technique for the design of lenses. Using this theoretical construct diffraction limited optical systems may be fabricated. The important point is that diffraction limited optical systems are limited by the properties of light. The general inference is that the theoretical construct is correct because what can be designed and fabricated is limited by the natural properties of that which is operated upon by the system. In this case a further refinement in the theoretical construct would not lead to an increase in the resolution of a diffraction limited system.

The question to be asked is: would further refinement in theoretical expressions of electromagnetic forces lead to any improvement in electro-magnetic devices? The other area of concern is in conceptualizations. Is it proper to attribute to the (model of) the electron the results of disparate experiments, i.e. charge, mass, radius, magnetic moment, "spin". Is an electric current the movement of discrete "charges".

The Weltanschauung of the theoretical physicist is that there is some overall unifying concept. The use of models, i.e. the 'electron', is a reflection of this idea. I hesitate to cite the Einsteinian view of 'equivalence', not only because it is totally wrong but philosophically incorrect. Nevertheless the blind and misguided application of this idea by the Relativists goes on even when confuted by experimental facts.

The real reason why philosophical surds like central order, universal formal principles and equivalence persist is because the ambiguities they create offer endless lebensraum for the creation of pseudo-physical theoretical dreams by the epigones. None of this, ipso facto, can offer mankind any help in the rationalization of the physical world.

It is not the fault of electro-magnetism that ten different theories exist for the 'explanation' of electromagnetic forces.

Proper experimental science consists of the design and execution of simple experiments in which the result is the unambiguous revelation of a simple truth. The prismatic dispersion of white light into a spectrum of colors, the attraction or repulsion of parallel current carrying wires. The generator action of a rotating magnetized conductor, the numerology of the periodic table of elements and the rationalization of organic chemistry by the benzene ring or double-helix are such simple truths.

Some physicists call themselves experimentalists because they take data from experiments. Others call themselves theoretical scientists because they dream the dreams of the paranoid and schizophrenic.

What is useful for mankind is the simple observation of an experimental result which in itself creates a new world from the old.

The world is round, not flat. The planets revolve around the Sun, not around the Earth. The benzene ring rationalizes organic chemistry. Gravity is a flow not a force. Space consists of pure energy, the distortion of which engenders the created world.

All of these observations are the result of the examination of many experiments, the collation of enormous data. If it is said that to read the results of one year's accumulation of experimental data takes 12 years, then the reader has not learned to reject the absurd, to cull out the ineptly taken experimental data, to exercise discrimination between the real and the unreal.

The complete scientist is a balanced person. He has the discernment and discrimination to perceive the underlying truths of nature, hidden beneath the multiplicity of experimental appearances. He has enough sense not to extend his theoretical expectations beyond the resolution of his experiments. Nor to delude himself into thinking the manipulations of mathematics can offer him more insight than the conceptualizations on which they are based.

What is required in Science is not the training of more clones or epigones. What is required is the balancing of the individual, the harmonization of thinking. The development of insight, and observational instincts to discriminate between the real and the unreal. That is Science.

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