MATHEMATICS AND PHYSICS THEORY

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A fundamentally unified theory of physics must have only one cause for the operation of the universe. What now appear to be separate causes would be defined from the start as different aspects of one single cause. It would be a single core cause for all effects. It would be the basis upon which the fundamentals of physics and all further theory would be derived. Theoretical physics is seeking a unified theory that can account for all effects. If *all effects* really does mean all effects, then, this unified theory must give the reasons: Why change of velocity occurs, why life occurs, and why intelligence occurs.

Theoretical physics cannot bridge the gap between mechanics, life and intelligence. One reason is because the tool of theoretical physics is math. Math cannot be used to define the nature of life and intelligence. Pure math is the manipulation of equalities. Theoretical physics also uses mathematics for the manipulation of equalities. However, theoretical physics additionally involves the mechanical interpretation of equalities. Mathematical equations form the orderly infrastructure to which the ideas of theorists become attached. This rigid dependence upon mathematical equations also imposes a limitation on theory. It keeps theoretical physics mechanical. In this respect, theoretical physics uses the equal sign without giving sufficient recognition of that sign's mechanical function.

In physics theory, the function of the equal sign is to represent any and all causes by which change occurs. All causes can only be symbolically represented in a general manner because we never isolate a cause. There have been many mechanical inventions of the mind credited with causing events to occur, but no scientific discoveries of any verifiable physical means by which the universe operates. Experimental physics measures initial conditions and resulting effects, both of which are values of changes of velocity. Experiment has always failed to discover the nature of a cause of change of velocity. If we then try to use theory to discover the nature of a cause by which change of velocity occurs, we must fail. We fail because theory relies upon mathematics. The mathematics is founded upon patterns in changes of velocity. It is capable only of extrapolating new possible changes of velocity.

Mathematics does not have powers beyond the manipulation of known quantities. If the universe is incomprehensible to us when we form our equations, then, it will remain incomprehensible to us no matter how we use those equations. If we leave out knowledge, even through ignorance, in originally defining the problem, then we cannot gain knowledge by completing the problem. This does not mean the equations will not give an impressive range of accurate predictions. They are always formed to imitate the patterns found in empirical

evidence. As long as reality follows these patterns, our equations will successfully extrapolate correct answers. These answers are always about results and never about causes.

So we can only imagine the nature of a primary cause. Theorists imagine what may be the nature of the unknown and invent physical causes that are impossible to verify empirically. One common invention is field theory. Whether it is electric, magnetic, gravitational or even space-time, it is empirically unverified. The failure to classify them as being only imagined to exist is a scientific mistake. It is true there is always an empirical basis for making these guesses, however, they are only the best guesses of theorists and not everyone should be required to believe in them. Obedience is often not the friend of scientific learning.

This does not mean that field theories are not useful. They are useful as symbolism. Even the concoction of extra dimensions serves as useful symbolism. As long as the mathematics of a theory fits the empirically determined patterns of change of velocity then the theory can make good predictions. We receive all of our empirical information via photons. Photons begin with change of velocity and end with change of velocity. As we learn more, we sometimes discover new variations in the patterns. At this point the equations fail to make accurate predictions.

The theorists then re-imagine what may be the case. The theorist must rely upon imagination because mathematics cannot yield something not already made certain in the setting up of the original equations. If an equation is set up to predict the effects of an undefined cause, it cannot then be used to define that unknown cause. If it was unknown when the equation was constructed then there is no amount of manipulation that can bring to light the nature of the cause of the effect. Mathematics is not intelligent and cannot invent ideas. It is never intuitive.

The equations are limited to mechanical use. However, this natural limitation is made more severe for two reasons. One is their incompleteness which, when discovered, is improved upon. Another is our own artificial restraints which are often retained as being immutable truth. An example of this kind of artificial restraint is the assignment of unique units for properties whose nature is unverified. These invented units are the one part of incorrect theory that becomes involved in the manipulation of equalities. I call them invented because they represent the theorist's attempt to quantify something whose physical nature or cause is undetermined. The only two units that are natural and obvious are distance and time.

All of our knowledge about the mechanical operation of the universe comes to us in the form of distance or time or combinations of the two. These are the two units now in use that can be trusted with certainty. If the true nature of a theoretical concept is empirically undiscoverable then units invented to represent it should be treated as temporary substitutes for ignorance. They are names of convenience that hopefully will eventually be replaced with natural units. In the interim, the temporary units can be useful for symbolically representing the ideas behind the partial theory for which they are a part. The names given to individual parts of the equations may be artificial, and, their theoretical interpretations may be wrong. However, this problem can be tolerated until we learn more. We can temporarily tolerate theoretical shortcomings because our theories are coordinated with the concurrent level of physical evidence.

Eventually, the constraints we place onto our equations will limit their range of correct predictions. When this happens, we must review old thoughts and formulate new thoughts about what may be true. We must then adjust our equations to represent the new thoughts. Mathematics is the symbolic restating of these thoughts. We think our thoughts and then write them down in symbols. The rules of mathematics help us to keep both our numbers and our thoughts straight. If we reach a point where we can no longer give logical reasons for the

meaning of our equations, then our equations cannot make us understand. We still have the numbers for predicting changes of velocity. We can still use the results for practical purposes. However, we no longer understand what we are trying to say.

I recognize math is a crucial part of a serious discussion about physics. It is the means by which the theorist can demonstrate consistency between theory and experiment. It is what makes the theory mechanically useful. I use as much math as is necessary to communicate my ideas. I think, though, if physics ideas cannot be explained using logical statements, then the ideas are probably not understood.

Mathematics is not the language of the universe. Mathematics is a tool for the mechanical interpretation of the universe. Whatever meaning becomes attached to our equations is in the thoughts of the theorist. If the theory is wrong then the equations will mirror our wrong ideas and their complications back to us. To overstate the importance of mathematics is to leave us vulnerable to blindly following equations whose interpretations have acquired unreasonable and even absurd meaning.

Our understanding of the universe must extend far beyond the realm of abstract mathematics. What is the equation that describes life? What are the patterns in changes of velocity that model intelligence? The answers about the nature of the universe exist in the potential of human reason. Our interpretations of our mathematical equations should be compatible with reason or least with real knowledge. It should not be necessary and is not enlightening to add extra fundamental forces or extra dimensions or extra universes. We should not have to theoretically smudge out singularities, as in string theory, in order to *save* mechanical theory.

The universe gave birth to us. We are formed from its constituents, the properties of which result in everything we have become. Our lives and intelligence are its ultimate achievement. Our intelligence came from it and must know something about it. The real language of the universe has to be contained in human intelligence. It is within our ability to be logical far beyond the simplistic logic of mathematics and to comprehend the universe far beyond patterns of change of velocity.

Human reason, as it pertains to the operation of the universe, must be the master of the tool we call mathematics. We will always need mathematics to help us solve our mechanical problems. However, there is much more to understanding than knowing the mechanics. We must think beyond the mechanical limitations of mathematics. Our scientific quest of enlightenment must not be limited to mathematically expressed knowledge. The branch of mechanical science we call theoretical physics is not nearly enough to understand the nature of the universe. We require intuitive human intelligence to solve problems of universal understanding. Our intellectual inquiry of our universe must produce answers that unite mechanics, life and intelligence.