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# A NEW METAPHYSICS IN SUPPORT OF CONTEMPORARY PHYSICS: EAST-WEST CONTRIBUTIONS

by

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# I. INTRODUCTION

The metaphysical basis of Newtonian classical physics was Descartes' radical dualism of mind and matter. This Cartesian dualism allowed classical physicists to treat matter as completely separate from mind, i.e., as completely dead, inertial, and devoid of self-motion. Hence came the mechanistic view of classical physics, according to which material particles are solid and discrete, having only external locomotion; space and time are absolute; physical reality is strictly causal and deterministic in character; and the world can be described objectively without reference to the human observer.

But contemporary physics with its theory of relativity and quantum theory has shattered all these mechanistic concepts and suggested in a revolutionary way the mutual interdependence of space, time, and matter, the unity of all things including the human observer, the dynamic and indeterministic character of the world, and so on. Contemporary physics, especially quantum physics, has also suggested that mind and matter are closely connected, contrary to the dualism of Descartes. It seems therefore that contemporary physics needs a new metaphysical basis which is different from Cartesianism. The purpose of the present paper is to find such a metaphysical basis.

We can say that contemporary physics has discovered two very important points: (1) the unity of all things in the universe, and (2) the unity of mind and matter. Therefore a new metaphysical system which attempts to sustain contemporary physics should contain these two points and explain them coherently and cogently. The present paper in its final chapter (Chapter VI)

will attempt to develop such a metaphysics, but before that we will look into: the transition from classical to contemporary physics, which resulted in the discovery of the above two points (Chapter II); two of the most important metaphysical models suggested so far by contemporary physicists with respect to these points, i.e., one by Henry Stapp and one by David Bohm (Chapter III); the contributions which Aristotle's metaphysics and Mahayana Buddhism, representing West and East, respectively, can make to the development of such a new metaphysics (Chapter IV); and the contribution from Unificationism, which arose from Korea yet attempts to unite East and West (Chapter V). Let me explain a little more about what Chapters III, IV, V, and VI are going to do.

Chapter III will deal with the metaphysical models of Stapp and Bohm. It will be seen that in explaining the unity of all things, Stapp and Bohm have suggested two different views of the unity of mind and matter, i.e., that whereas the former finds the mind-matter unity within every particular thing with respect to its own probability amplitude without referring to any divine agent to adjust various probability amplitudes, the latter sees the unity of mind and matter in terms of an adjusting and underlying mental Deity "enfolded" in every particular material thing without referring to the distinctive mentality of each particular thing. It will be noted that if synthesized under some revision, the two different views would together produce a metaphysics of the type we are seeking -- a metaphysics which, in explaining the unity of all things, consistently finds the mind-matter unity not only within every particular thing but also within an adjusting

Deity.

Chapter IV will treat Aristotle's metaphysics and Mahayana Buddhism -- two representative metaphysical systems from West and East, respectively. They will be examined and evaluated to see how much they fit in with contemporary physics and what unique contributions East and West can each make to the development of a new metaphysics in support of contemporary physics. It will be seen that Aristotle's metaphysics has a commendable doctrine of mind and matter (hylomorphism) and a recognition of the existence of God, but inconsistently exempts God from the application of that doctrine, regarding him only as "pure act," so that it cannot successfully explain the unity of "substances." Regarding Mahayana Buddhism, we will see that it has a dynamic view of the unity of all things (pratītyasamutpāda) based upon its existential realization of "Emptiness" (Śūnyatā) as the negation of the antinomous unity of "being" and "non-being" in the world and further as the negation of that negation, but that its characteristically negative language sounds a bit obscure about the positive role of mind and matter and about the positive presence and function of Emptiness to unite all things. It will be noted that Aristotle's metaphysics and Mahayana Buddhism make complementary contributions to the formation of a new metaphysics which attempts to find a coherent explanation of the unity of mind and matter and the unity of all things, but that such a new metaphysics should avoid the Aristotelian problem of inconsistency and the Buddhist problem of obscurity mentioned above.

Chapter V will discuss Unificationism. Like Aristotelianism Unificationism has a doctrine of the unity of mind and matter

(Sung Sang and Hyung Sang), but unlike Aristotelianism it consistently applies that doctrine to the whole of reality including God and on this basis maintains the unity of all things which Aristotle failed to maintain. Like Mahayana Buddhism Unificationism is deeply aware of the unity of all things, but it avoids the above-mentioned Buddhist obscurity by clearly basing it upon the divine unity of mind and matter within God who Unificationism believes exists with a definite purpose to unite. Thus Unificationism is a positive synthesis of Aristotelianism and Mahayana Buddhism, while at the same time avoiding their difficulties. It will be noted therefore that Unificationism is a very good candidate to serve to develop a new metaphysics in support of contemporary physics.

While Unificationism has emerged from the East, there has arisen from the West as well a very good candidate for our purpose. It is the metaphysics of Whitehead, which was developed independently from Unificationism but fits in very well with contemporary physics in much the same way Unificationism does. It will not be treated in the present paper, however, except when it is very briefly compared with Unificationism. But its existence tells us that both East and West can equally make contributions of the same type, even though generally their contributions are different and complementary.

Chapter VI, the concluding chapter, will describe a new metaphysics of the type we are seeking. It will ne noted that such a metaphysics emerges from a constructive synthesis of the models of Stapp and Bohm and also from a synthesis of the complementary contributions of Aristotle's metaphysics and Mahayana

Buddhism, while at the same time avoiding the disadvantages and difficulties these models and traditions have. According to such a synthetical, new metaphysics, the unity of mind and matter means that everything without exception (God included) has two sides of mentality (active) and materiality (passive) within itself, which are distinguishable yet dynamically united as one. God has a very important role in that the dynamic unity of his own two sides activates and makes always dynamic the unity of the two sides of each particular thing in the world. The dynamic unity of the two sides of a thing, in turn, enables that thing itself to become somewhat similar to its own active mental side, so that it is no longer a purely material, solid thing incapable of relationships and communications but rather a thing capable of genuine relationships with other such things as long as there is a common mental denominator. Hence the real unity of all things obtains.

The role of God in such a metaphysics is different from the supernatural role of the wholly transcendent God of classical physicists such as Boyle and Newton. Classical physicists denuded the physical world of all activity and self-motion based upon Cartesian dualism, so that they had to magnify the power of God, maintaining that the wholly transcendent God imposed laws of motion by fiat upon the world and put it in motion. For many, however, it was quite difficult to accept this kind of God. For the natural laws of motion as observed in the deterministic world seemed to be very neat and self-sufficient without recourse to this kind of God. Whether naturally or ironically, this eventually led to the dominance of atheism and materialism in physics. But the God of our new metaphysics has no problem of this sort, for he is consistent

with the world in that he himself has his two sides of mentality and materiality just like all things in the world. This God is unique and different from the world, however, in that the dynamic unity of his own two sides constitutes the primary lure for the unity of the two sides of everything in the world, thus urging all things to unite with each other.

## II. FROM CLASSICAL TO CONTEMPORARY PHYSICS

Classical physics was based upon a rather unfortunate philosophical innovation which took place in the seventeenth century. Before this innovation, Aristotle's hylomorphism, which saw "form" and "matter" as inseparable correlatives in the physical existent, was dominant throughout the entire Medieval epock until the beginning of the modern period. According to this hylomorphism, form and matter can never be found in separation from each other, and in their unity form and matter represent "act" and "potency," respectively, the former giving activity and definiteness to the latter which in turn is the passive recipient of activity and definiteness. But the philosophical innovation of the seventeenth century separated form and matter completely, dividing all existence into two independent, ultimate kinds, mental and physical. The Cartesian dualism of mind (res cogitans) and matter (res extensa) was typical of this. As a result of this, matter was treated as completely devoid of activity or agency and completely passive and inertial. In fact, Kepler was the first to characterize matter as "inert" in this context: "Inertia or opposition to motion is a characteristic property of matter; it is stronger the greater the quantity of matter in a given volume."[1] His inertial

concept of matter was able to well explain the newly discovered elliptical orbits of planetary motion. It should be noted here that after matter was denuded of the quality of activity it was quantified to be called "mass." Newton, too, spoke of mass as "quantity of matter" or "measure of matter" and regarded it as the numerical indication of the degree of inertia of a material body. This well fitted in with his celebrated three laws of motion in his mechanics. All this led classical physics to believe the following several basic points:

Firstly, the physical existent as inactive, inertial matter can be broken as far as possible into elementary particles which are solid, hard, indestructible, and always identical in their mass and shape.

Secondly, all physical events are reduced to the locomotion of material points in space, caused either by collision or by gravitational attraction. The physical existent as inactive matter does not move itself; it is only moved. The physical is itself changeless, having no internal change nor any process of becoming within itself. The only possible change it has is a purely external change of place, i.e., of being moved from one place to another (locomotion).

Thirdly, physical existents (including elementary particles) are external to each other. They are discrete and separate in space, thus not internally related to each other. The fundamental nature of each is independent of that of the other. Their external relations by way of collision and gravitational attraction do not change their fundamental natures.

Fourthly, the physical as inactive matter can be objec-

tively described without reference to the human observer who has mentality and consciousness.

Fifthly, space and time are absolute, having no connection with each other and no connection with the material world. Absolute space is always at rest and unchangeable, and absolute time flows smoothly from the past through the present to the future. In the words of Newton, "Absolute space, in its own nature, without regard to anything external, remains always similar and immovable,"[2] and "Absolute, true, and mathematical time of itself and by its own nature, flows uniformly, without regard to anything external."[3] Physical existents as inertial matter move in this absolute space and time which are external to them.

Sixthly, the world of physical phenomena is causal and deterministic based upon fixed laws of motion. Every event has a definite cause and gives rise to an effect. Any future event can be predicted with absolute certainty.

Lastly, the physical world devoid of activity and self-motion needs a powerful, supernatural, transcendent God who sets it in motion under the fixed laws of motion he imposes upon it. This is an argument for the existence of God upheld by early classical physicists such as Boyle and Newton. In fact, Newton argued for the need for a cosmic spiritual being to explain the force of gravitational attraction which he thought was acting instantaneously over a distance between masses. Of course, this kind of supernatural God was later regarded as superfluous and eventually denied in favor of atheistic materialism among physicists, because the deterministic language of the fixed laws of motion themselves seemed very successful in explaining everything

without recourse to any God.

Until the nineteenth century, the mechanistic vision of classical physics with the above several basic points was very successful and regarded as absolutely valid by every serious scientist. Around the middle of the century, however, there occurred a profound change in classical physics. It was that Faraday and Maxwell, based upon their study of electromagnetic phenomena, newly suggested the concept of a force "field," which replaced the classical concept of a force. According to this new understanding, a force "field" in space is the potential of producing a force whether or not a material body is present in that field. Thus forces are not regarded as rigidly connected with material bodies they act upon but rather conceived of in terms of fields which are their potentials in space. Unfortunately, however, Faraday and Maxwell were not free yet from the mechanistic view of classical physics. In fact, Maxwell after all treated fields as states of mechanical stress in a hypotheical space-filling medium, called "ether." Thus the revolutionary significance of the concept of a field was not fully recognized until Einstein in the beginning of the twentieth century.

Contemporary physics has two main accomplishments which were made independently: relativity theory and quantum theory. The former is going to be dealt with now, and the latter later in the present chapter. Einstein as the chief initiator of the former explained fields in a non-mechanistic way, denying the existence of ether in space. According to him, space, time, and matter are deeply interconnected with each other. Thus his special theory of relativity says that space and time form a four-dimensional con-

tinuum, "space-time," so that the Newtonian concepts of absolute space and time are no longer acceptable. Even mass depends upon its velocity. Mass is also equivalent to energy, as is seen in the famous equation: $E=mc^2$. All this in the special theory has been verified by experiments. Einstein's general theory of relativity is an extension of this special theory to include gravity. According to the general theory, the gravitational field of material bodies causes the curvature of space and time.

What relativity theory actually means to say therefore is that all material bodies are united through a field spread through all space and time. It is no longer correct to say that because elementary particles are solid and indestructible, material bodies, their aggregates, are discrete from and external to each other. For according to relativity theory, particles are merely the representatives of some strong or stable regions of a given field spread through all space and time, just like vortices are merely stable patterns or forms of flowing water. We can speak of particles for the sake of convenience, but they do not actually exist; they are derivative abstractions of certain stable forms in the underlying continuum field of movement. Vortices, too, are appearances in the moving water; they do not actually exist. If two vortices are brought together, they will modify each other and eventually merge. In much the same way, if two material particles are put together, they will affect each other and eventually become one. Thus particles are deeply united through an underlying field, so that material bodies, their aggregates, are intimately related to each other, too.

Nevertheless, Einstein's relativity theory has the problem

of "locality." That is to say, it holds that different fields are only locally connected, so that if they are distant from each other, there is no connection. In this sense, relativity theory is still somewhat similar to mechanistic classical physics. It is at this point that we proceed to deal with quantum theory which is more fully non-mechanistic than relativity theory.

According to quantum theory, matter and energy have a wave-particle duality. Depending upon how they are seen, they appear sometimes as particles, sometimes as waves. An electron is normally a particle, but it can also behave like a wave. Light is ordinarily an electromagnetic wave, but it can also behave like a particle. What is interesting is that particles of light are indivisible lumps or packets (quanta in Latin), which explains why the energy of heat radiation is not emitted continuously. These light quanta gave quantum theory its name. They are now called photons; they have no mass and travel with the velocity of light.

The wave-particle duality has much to do with the observable fact that particles do not exist with certainty at definite places and definite times but rather only tend to exist. Their tendencies to exist at definite places and definite times are mathematically expressed as probabilities. They are waves, which are called "probobility waves." Particles which are thus also waves cannot be isolated from each other. They are closely interconnected with each other through faster-than-light influences. Thus particles' probability waves are probabilities of their interconnections. According to quantum theory, they are interconnected, no matter how distant they are. This property of "non-local" interconnection in quantum theory overcomes the problem of locality

in relativity theory. All entities in the universe are interconnected also in such a way that the human observer is an essential part of that interconnection.

From above we can safely say that both relativity theory and quantum theory agree in suggesting the unity of all things. Of course, the two disagree on other issues. That is, whereas relativity theory requires strict continuity, strict determinism, and strict locality, quantum theory requires just the opposite -- discontinuity, indeterminism, and non-locality. But there is no doubt that these two different theories lead us to the same idea: the unity of all things in the universe. In fact, relativity theory led Arthur Eddington in 1933 to declaim on "the wide interrelatedness of things,"[4] while quantum theory made Werner Heisenberg say in 1958: "The world thus appears as a complicated tissue of events, in which connections of different kinds alternate or overlap or combine and thereby determine the texture of the whole."[5]

Then, how is mentality or activity understood in relationship to the unity of all things in contemporary physics? As we have seen, classical physics, which regarded matter as completely devoid of mentality or activity and completely inertial, was based upon Cartesian dualism which separated mind and matter in defiance of Aristotle's hylomorphism. But contemporary physics has shattered the worldview of classical physics, so that it must naturally be againt Cartesian dualism. In fact, contemporary physicists very often talk about the unity of mind and matter and relate it to the observed fact of the unity of all things. In the following chapter, I will choose two contemporary physicists, Henry Stapp and David Bohm, to see their different views regarding this.

## III. THE METAPHYSICAL MODELS OF STAPP AND BOHM

Henry Stapp's view, based upon the "orthodox" quantum theory of Heisenberg with respect to probability amplitutes, holds that the world actually perceived is constructed from myriads of "actual events," each of which is effectively "a decision between various possible alternative, perceptually distinct courses of action" in the macroscopic context of a quantum measuring device.[6] An actual event effectively decides which is to be selected from among the various possibilities available prior to this event. This decision is a "spirited" or "mental" act of that physical event. It is not identified with something completely different but with the physical event itself:

> ... there is no identification of a mental aspect with something wholly different. Rather a mental act is identified with a physical act, and both of these acts are the very same act, that is, the act of deciding between alternative possible modes of behavior that are, prior to this act, allowed for the macroscopic physical system.[7]

This means the unity of mind and matter in each actual event. According to Stapp, the unity of all things, in turn, obtains because each actual event, which is a possibility actually selected from among many alternative possibilities, is nothing but an "objective tendency" or "potentia" in terms of its probability amplitude in relationship to the behavior patterns of other actual events. "What we find, therefore, are not elementary space-time realities, but rather a web of relationships in which no part can stand alone; every part derives its meaning and existence only from its place within the world."[8]

David Bohm's view is a bit different from Stapp's. According to Bohm, each physical event, constituting a part, "enfolds"

in itself the underlying whole which is basically mental with its active "holomovement." The mental whole is actively enfolded in each physical event, which in turn is unfolded into the whole.[9] This relationship of enfolding and unfolding between the mental whole and each physical event constitutes the unity of mind and matter. The unity of mind and matter in this sense secures the unity of all physical events because when each of these events (parts) enfolds the whole, they somehow enfold each other through the mediation of the whole. Even though this mediation might prevent them from exerting direct causation upon each other, they are still internally related to each other. Bohm calls this order "the enfolded order" or "the implicate order," maintaining that it is an order which contemporary physics would describe.[10] What is interesting is that Bohm thinks of the holomovement of the whole as holy, intelligent, and compassionate, so that he virtually equates it with God.[11]

Let us compare the above two models. Stapp's model lets each physical event have its own distinctive activity or mentality, thus seeing the unity of mind and matter within each event, so that it has an advantage of being able to directly relate all events to each other through some mutual adjustment of their respective probability amplitutes. But it has a disadvantage of not having any central agent to coordinate this adjustment, entrusting the adjustment entirely to the complex of their various mentalities. Without any coordinating agent, the adjustment would not be completely explicable nor even attainable. By contrast, Bohm's model has no disadvantage of this kind, since it has the holomovement of the whole (God), through the mediation of which

the adjustment of probability amplitudes of all events is done. But Bohm's model has a disadvantage of not allowing events to directly affect each other, since it asserts that they are related only through the mediation of the whole. This model also does not let each physical event have its own distinctive mentality, thus not clearly seeing in each event the unity of mind and matter of its own.

After having compared the two models, I suggest to synthesize them to create a more feasible model. More specifically, I suggest to synthesize their advantages, i.e., Stapp's recognition of the unity of mind and matter within every actual event and Bohm's doctrine of the divine holomovement of the whole. In our synthesized model, therefore, we boldly follow Bohm in accepting the existence of God as the agent to coordinate the above-mentioned adjustment, but consistently applies Stapp's understanding of the unity of mind and matter both to all events and to God, thus arguing that that dynamic unity is found both within every event and within God himself. This way we can avoid the disadvantages of both models and maintain the direct causal relations of events which are at the same time directly mediated by God. This new metaphysical model is to be gradually developed, as we go through the subsequent chapters of the present paper.

## IV. ARISTOTLE"S METAPHYSICS AND MAHAYANA BUDDHISM EAST-WEST CONTRIBUTIONS

Aristotle's metaphysics has a commendable doctrine of the unity of mind and matter (hylomorphism), according to which any particular existent is a composite of "form" and "matter." While

matter represents what a particular existent is made of, form denotes what it is made into. Form and matter also represent "act" and "potency," respectively. Act gives activity and definiteness to potency, which in turn, as the capacity to be actualized, passively receives activity and definiteness. Aristotle explains all physical change in the world in terms of this dynamic relationship between form and matter -- a relationship which also necessarily involves "privation," i.e., the lack of a certain form. According to him, all physical change consists of matter acquiring a form which it did not have before. What is important here is that form and matter are always inseparable correlatives in the constitution of each particular existent, i.e., that they can never be found in divorce from each other.

Then, would this commendable Aristotelian doctrine of the unity of form and matter lead to the unity of all particular existents? Given Aristotle's conception of form as act, one might expect him to hold that particular existents are so activated by their active forms as to be flexible enough to be internally related to each other. Unfortunately, however, Aristotle does not believe this. On the contrary, he admits that particular existents (primary substances) are not internally related to each other, when he says: "Substance, in the truest and primary and most definite sense of the word, is that which is neither predicable of a subject nor present in a subject."[12] In other words, primary substances are neither predicable of each other nor present in each other, while forms (categories) are present in primary substances as their predicates. The reason is that forms present in primary substances as their predicates lose their original

activities when they turn out to be merely "universal abstractions" from particular substances, so that they cannot lead primary substances to be internally related to each other. In this situation, there can be no inner "motion" (kinēsis) within a primary substance; a substance has only three kinds of accidental (not substantial) motion -- of quality, of quantity, and of place.[13]

In order to remedy this problem, one might think that Aristotle could appeal to the power of God. For according to Aristotle, God has a creative power to move and attract the world as its "formal cause," "final cause," and "efficient cause" in the actualizing process of the world. Thus one might expect Aristotle to maintain that God, using this power, re-activates abstracted forms or categories, so that they, after being re-activated, may be able to lead particular substances to be internally related. But unfortunately again, Aristotle does not maintain this, either. For according to this Greek philosopher, God does not have within himself the unity of form and matter, since he is "pure form" completely devoid of materiality. As pure form God is also "pure act" devoid of all potentiality; he is completely actualized and wants nothing. This kind of God is not acted upon by the world at all, while he acts upon it; he is the "Unmoved Mover." With this one-way and therefore imperfect relationship with the world, God would not be able to effectively activate abstracted forms or categories in the world. God would only be able to genuinely activate categories if he had a perfect, two-way relationship with the world -- a relationship which can be established if he has the unity of the two poles of form and matter within himself just like

each particular thing has it within itself. Criticizing Aristotle's doctrine of God in this kind of context, Charles Hartshorne and William L. Reese say: "It seems evident, then, that the range of Aristotle's affirmations demands an interpretation of deity capable of allowing opposed predicates to stand in contrast without conflict -- demands, that is to say, an interpretation which provides for dipolarity [within God]."[14]

Thus Aristotle's metaphysics, in spite of its recognition of the unity of form and matter within each particular thing, fails to affirm the unity of all particular things because it does not consistently recognize the unity of mind and matter within God himself. God as "pure form" cannot stop forms in particular things from being deprived of their original activities in the process of their abstraction. Nevertheless, Aristotle's metaphysics makes a very useful contribution to the development of a new metaphysics in support of contemporary physics in that, given its doctrine of the unity of form and matter and its doctrine of God, it makes us realize that if God, too, has the unity of form and matter within himself, the unity of all particular substances will be secured.

Let us now proceed to Mahayana Buddhism. In this school of Buddhism, whose development owes much to Nāgārjuna of the second century, the doctrine of Śūnyatā ("Emptiness") plays a central role. Śūnyatā is not just a concept but something which should be experienced with existential profundity, so that it is quite difficult to describe it. But let us describe it by starting from the world of phenomena.

This world, according to Buddhism, has nothing which is unchanging, eternal, and substantial. Thus the substantial nature

of ātman ("self") is denied, and anātman ("no-self") is advocated instead. To put it in another way, everything in this world has within itself the self-contradictory and dynamic unity of "being" (u) and "non-being" (mu), in which u and mu are Japanese words. Interestingly, u and mu here are respectively equivalent to Plato's "being" (to on) and "non-being" (me on), which according to Plato are respectively represented by "form" and "matter" because form determines the actual existence of a particular thing, while matter is formless and undetermined in itself. Therefore Mahayana Buddhism's doctrine of the unity of u and mu is also equivalent to Aristotle's hylomorphism mentioned previously. Masao Abe explains the self-contradictory, dynamic unity of u and mu within everything in the world as follows:

> They [u and mu] are entirely relative, complementary, and reciprocal, one being impossible without the other. In other words, mu is not one-sidedly derived through negation of u. Mu is the negation of u and vice versa. One has no logical or ontological priority to the other. Being the complete counter-part to u, mu is more than privation of u, a stronger form of negativity than 'non-being' as understood in the West. Further, u and mu are completely antagonistic principles and therefore inseparable from one another, and thus constitute an antinomy, a self-contradiction.[15]

Let us now proceed to Śūnyatā as understood in Mahayana Buddhism. Śūnyatā as Emptiness is realized when the above-mentioned self-contradictory oneness of u and mu in the world is overcome, transcended, and negated. Thus it is neither u nor mu but absolute Mu as distinguished from relative mu. What is important, however, is that as absolute Mu, Śūnyatā is not just an objectified Emptiness standing outside of the world. Rather, it "empties" itself to become non-Emptiness, i.e., Fullness or wondrous Being, and thereby dynamically stays immanent in the world. Thus Śūnyatā has within itself the dynamic unity of Empti-

ness and Fullness antinomous to each other.

According to Mahayana Buddhism, Śūnyatā as understood this way constitutes the basis of the unity of all things in the world. For its dynamic unity of Fullness and Emptiness, while being beyond u and mu in the world, stays there to make possible the dynamic unity of u and mu within each particular thing, thus enabling various things to be internally related to each other. Hence comes the Buddhist doctrine of pratītyasamutpāda, which can be translated as "dependent origination," "relationality," "relational origination," or "dependent co-arising."[16]

Thus Mahayana Buddhism tells us that in order for all things to be genuinely related to each other, each of them has the unity of u and mu within itself and Śūnyatā, too, has the unity of Fullness and Emptiness within itself. So, if it is correct to say that the unity of u and mu or the unity of Fullness and Emptiness is virtually equal to the unity of mind and matter,[17] we can say that there is the unity of mind and matter both within each particular thing and within Śūnyatā. Śūnyatā in Mahayana Buddhism is regarded as God by Kitaro Nishida, a noted Japanese Mahayana Buddhist of this century, even though according to him this God exists only in relation to the world, not in separation from it.[18]

The above position of Mahayana Buddhism is very useful for the development of a new metaphysics in support of contemporary physics because it coherently explains the two points discovered by contemporary physics: (1) the unity of all things, and (2) the unity of mind and matter. Mahayana Buddhism consistently sees the unity of mind and matter both within each particu-

lar thing and within God, thus overcoming the Aristotelian difficulty in internally relationg all particular things. Another important strength of Mahayana Buddhism is the existential and experiential character of its insight into the dynamism of the whole of reality.

Mahayana Buddhism, however, has at least two problems. Firstly, its language is characteristically negative, based upon one's existential experience of the reality of antinomy. Its emphatic use of such words as anātman, mu, Mu, and Śūnyatā might, in spite of its experiential profundity, not be able to correctly describe reality. True reality may not be as negative as one might think. It might be better, therefore, to use the language of mind and matter than that of u and mu in explaining the discoveries made by contemporary physics. Secondly, more importantly, Śūnyatā, in spite of its dynamic structure which means to explain the unity of all things, seems to be simply something created from below rather than something already there with a definite plan to unite, for Mahayana Buddhism starts from the phenomenal world of u and mu and then reaches Śūnyatā as its negation and further as the negation of that negation based upon experience. Therefore this Buddhist approach from below cannot probably be an ultimate solution to explain the world.

So far we have dealt with Aristotle's metaphysics and Mahayana Buddhism which represent West and East, respectively. Let us now directly compare them by dealing with how they treat the following three points of concern shared in common by them: (1) the unity of mind and matter, (2) the existence of God, and (3) the unity of all things. The second point is an addition to

the other two which are already known to us as the ones discovered by contemporary physics. What is important here is that each of the three commom points is treated differently by the two different metaphysical models. The different treatments are sometimes still imperfect and sometimes complementary to each other.

The first common point shared by both Aristotle's metaphysics and Mahayana Buddhism is the unity of mind and matter. But they recognize this point somewhat incompletely. For the former only sees the unity of mind and matter in the world and not within God, while the latter, in spite of its good ability to see it both in the world and within Śūnyatā, uses a somewhat unfortunate, negative language about it.

The second commom point is the existence of God. But Aristotle's mataphysics and Mahayana Buddhism see God very differently and complementarily. The former sees God positively only as "pure act" without any material or "privative" side, whereas the latter's God is negatively put as Śūnyatā (Emptiness), which therefore still further negates itself to be Fullness as well. Aristotle's God is perfectly actualized and unchangeable, whereas Śūnyatā in Mahayana Buddhism is ready to be negated and changed. Aristotle's God is far above the world of experience, whereas Śūnyatā is existentially derived from the world below.

The third point is the unity of all things. Aristotle's metaphysics is interested in it but unable to secure it because of its unfortunate tendency of intellectual abstraction and also because of its view of God only as pure act. Mahayana Buddhism, by contrast, can at least support the unity of all things because

of its opinion based upon existential experience that the whole of reality including Śūnyatā has the dynamic, antinomous unity of being and its negation, even though its description of the role of Śūnyatā is still somewhat obscure due to its negative language.

The above comparison shows that neither Aristotle's metaphysics nor Mahayana Buddhism is perfect, but that both can make good, complementary contributions to the development of a new metaphysics in support of contemporary physics. In fact, our new metaphysics will be a synthesis of both, adopting their strengths and avoiding their weaknesses. If it is right to say that the above two metaphysical systems best represent West and East, respectively, then their contributions are indeed East-West contributions, and East and West will meat together in our new metaphysics.

## V. UNIFICATIONISM

Unificationism has a clear doctrine of the unity of mind and matter, calling mind and matter Sung Sang and Hyung Sang, respectively. These Korean terms can be roughly translated as "internal character" and "external form," respectively. Their unity is such that neither of them can be found in separation from the other. What is important is that Unificationism consistently applies this doctrine both to the world and to God, finding the unity of Sung Sang and Hyung Sang within every particular thing in the world and also within God himself. This consistent application of the doctrine in question in Unificationism has much to do with the Unification assertion that all things in the world were created in the image of God, whether directly (in the case of man) or indirectly (in the case of the rest of creation), so that

each thing in the world has the dual characteristics of Sung Sang and Hyung Sang within itself just like God has it within himself. God's Sung Sang is "the attribute of God that constitutes the fundamental cause of the invisible, functional aspect of all existing beings," while his Hyung Sang is "the attribute of God that constitutes the fundamental cause of the material aspect of all existing beings."[19]

It is based upon this consistent application of the unity of mind and matter both to all things and to God that Unificationism asserts the unity of all things. According to Unificationism, God's own dynamic unity of Sung Sang and Hyung Sang centered upon his "Purpose" generates "acting energy" to unite all things in the world, i.e., "to make all things interact with one another."[20] This is possible because God's "acting energy" thus generated activates the dynamism of the unity of Sung Sang and Hyung Sang within each particular thing in such a way that each particular thing is no longer a purely material, solid thing devoid of activity and incapable of relationship. All things are now somewhat similar to their active, mental Sung Sang sides, thus being able to be internally related to each other, as long as they have a common mental denominator. Therefore Divine Principle, the official doctrinal text of the Unification Church, says:

> Men can be united because the mind is a common factor in every person. Similarly, positive and negative ions are united to form a certain material because within each ion there are aspects of both internal character and external form which tend to unite, thus forming a molecule.[21]

Around the end of the preceding chapter, we compared Aristotle's metaphysics and Mahayana Buddhism in terms of their three common points of concern: (1) the unity of mind and matter, (2)

the existence of God, (3) the unity of all things. Let us now note that Unificationism has exactly the same poins of concern, but that in doing so Unificationism avoids the difficulties of Aristotelianism and Mahayana Buddhism and turns out to be a positive synthesis of the two metaphysical models from East and West.

In the first place, Unificationism finds the unity of mind and matter (Sung Sang and Hyung Sang) in the whole of reality including God. In this sense, it is like Mahayana Buddhism which existentially sees the antinomous unity of being and its negation in the whole of reality including Śūnyatā. But it is different from Mahayana Buddhism in that its terms, Sung Sang and Hyung Sang, do not sound as negative as the language of Buddhism. Unificationism in this regard might be closer to Aristotelianism which uses the more positive terms, form and matter, even though it does not follow Aristotle's inconsistent, incomplete application of the unity of form and matter which excludes God.

Secondly, Unificationism clearly recognizes the existence of God. In this sense, it is similar to Aristotle's metaphysics which firmly recognizes the existence of God. But it does not agree with the Aristotelian view of God only as pure form. The Unification assertion that God has the unity of Sung Sang and Hyung Sang would rather agree with the Buddhist view of Śūnyatā as the dynamic unity of Fullness and Emptiness than Aristotelian theism, even though unlike Śūnyatā in Mahayana Buddhism the God of Unificationism is not simply derived from the world below existentially.

Thirdly, Unificationism affirms the unity of all things

based upon its consistent application of the dynamic unity of Sung Sang and Hyung Sang to the whole of reality including God. So it overcomes Aristotle's inability to do so, even though it appreciates his interest (in spite of his inability) in the unity of all things. Unificationism in this regard is more like Mahayana Buddhism which sees the unity of all things based upon its dialectics of being and its negation in the whole of reality, even though Unificationism does not necessarily accept the negative language of Buddhism which tends to obscure the role of Śūnyatā to unite all things.

From above, we can understand that Unificationism is a positive synthesis of Aristotle's metaphysics and Mahayana Buddhism, being able to appreciate their good contributions but avoid their difficulties. Thus we can say that Unificationism is a very good candidate to serve to develop a new metaphysics which sustains contemporary physics.

Unificationism has come from the East. But we have a very good candidate from the West as well. It is the metaphysics of Alfred North Whitehead, which maintains in much the same way as Unificationism that there is the unity of the "mental pole" and "physical pole" both within God and within each particular "actual occasion," and that the unity of God's two poles, constituting his "initial aim," secures the unity of the two poles of each actual occasion and thereby brings forth the "perspectival" unity of all actual occasions.[21] Of course, Whitehead's God may not be as powerful as the God of Unificationism, since Whitehead postulates "Creativity" as a metaphysical ultimate outside of God and regards God merely as an embodiment (if an aboriginal one) of

this Creativity like actual occasions are its embodiments. But Whitehead's metaphysics is still a very good candidate to serve for our purpose. This can be easily understto because Whitehead was very much interested in contemporary physics and very anxious to explain it metaphysically. His metaphysics was developed independently from Unificationism. This shows that both East and West can equally make the same type of good contributions to the development of a new metaphysics even though the East-West contributions are normally different and complementary.

## VI. CONCLUSION: A NEW METAPHYSICS

In order to develop a new metaphysics which can sustain contemporary physics which has discovered the unity of all things and the unity of mind and matter, we have dealt with the models of Henry Stapp and David Bohm (Chapter III), Aristotle's metaphysics and Mahayana Buddhism (Chapter IV), and Unificationism (Chpter V).

We maintain that such a new metaphysics can be developed as a synthesis of the models of Stapp and Bohm and also as a synthesis of Aristotle's metaphysics and Mahayana Buddhism. In synthesizing these models and metaphysical traditions, we adopt their advantages but avoid their disadvantages.

First of all, our new metaphysics is a synthesis of the models of Stapp and Bohm. It adopts Stapp's advantageous recognition of the unity of mind and matter within every actual event but avoids his disadvantage of not having any central agent to coordinate the adjustment of various actual events. Our new metaphysics adopts Bohm's advantageous doctrine of the divine holo-

movement of the whole (God) to coordinate this adjustment but avoids his disadvantage of not being able to allow events to directly affect each other. This way our new metaphysics can say that the unity of mind and matter is found both within each actual event and within God, so that the unity of all actual events in terms of their direct causal relations is coordinated by God.

Our new metaphysics is also a synthesis of Aristotle's metaphysics and Mahayana Buddhism. It adopts Aristotle's commendable doctrine of the unity of form and matter within each particular thing and consistently applies it to the whole of reality including God, thus avoiding Aristotle's disadvantageous view of God as pure form which cannot sustain the real unity of particular things in the world. Our new metaphysics adopts Mahayana Buddhism's consistent view that the dialectics of being and its negation is found in the whole of reality including Śūnyatā, but avoids its somewhat negative language and therefore its obscurity about the positive existence and role of Śūnyatā to unite all things.

Our synthetical, new metaphysics, then, suggests that everything without exception (God included) has the unity of mentality (active) and materiality (passive) within itself, distinguishable yet dynamically united as one. God's role is that the dynamic unity of mind and matter within himself activates and makes always dynamic the unity of mind and matter within each particular thing in the world. The dynamic unity of mind and matter within a particular thing, in turn, enables that thing itself to become somewhat similar to its own active mental side,

so that it is no longer a purely material, solid thing incapable of relationship but rather a thing which can internally relate itself to other such things as long as a common mental denominator exists. Thus God with his own dynamic unity of mind and matter can secure the internal relations of all particular things with their own respective unities of mind and matter within themselves.

In this type of synthetical metaphysics, both East and West can meet together because Aristotle's metaphysics and Mahayana Buddhism, representing West and East, respectively, are synthesized there. That this type of synthetical metaphysics is feasible has been proven by the increasing popularity of Unificationism as well as of Whitehead's metaphysics. Also, the fact that Unificationism is from the East and Whitehead's metaphysics has emerged from the West shows that both East and West can make the same kind of contributions to the develpoment of a new metaphysics in support of contemporary physics.

FOOTNOTES

[1]Quoted in M. Jammer, "Mass (Physics)," The New Catholic Encyclopedia, p. 412.

[2]Quoted in Milic Capek, The Philosophical Impact of Contemporary Physics (Princeton, N.J.: D. Van Nstrand, 1961), p. 7.

[3]Ibid., p. 36.

[4]The Expanding Universe (Cambridge: Cambridge University Press, 1933), p. 120.

[5]Physics and Philosophy (New York: Harper Torchbooks, 1958), p. 96.

[6]"Quantum Theory and the Physicist's Conception of Nature: Philosophical Implications of Bell's Theorem," Richard F. Kitchener, ed., The World View of Contemporary Physics: Does It Need a New Metaphysics? (Albany: State University of New York Press, 1988), pp. 42-43.

[7]Ibid., p. 43.

[8]Ibid , p. 54.

[9]Wholeness and the Implicate Order (London: Routledge & Kegan Paul, 1980).

[10]"The Implicate or Enfolded Order: A New Order for Physics," John B. Cobb, Jr. and David Ray Griffin, eds., Mind in Nature (Washington, D.C.: University Press of America, 1977), pp. 37-42.

[11]"Hidden Variables and the Implicate Order," Zygon 20/2 (June 1985), p. 124; Renee Weber, "The Enfolding-Unfolding Universe: A Conversation with David Bohm," Ken Wilber, ed., The Holographic Paradigm and Other Paradoxes (Boulder, Co.: Shambhala, 1982),pp. 187-214.

[12]W. D. Ross, ed., Aristotle: Selections (New York: Charles Scribner's Sons, 1955), p. 3.

[13]Ibid , pp. 87-88.

[14]Philosophers Speak of God (Chicago: The University of Chicago Press, 1953), p. 71.

[15]Zen and Western Thought (Honolulu: University of Hawaii Press, 1985), pp. 127-28.

[16]Ibid., p. 125.

[17]Kitaro Nishida speaks of the unity of u and mu an terms of the unity of mind and matter, when he says: "Reality is the bound-

less self-conscious continuum through which one system is internally transformed into another. The moment in which this transformation occurs, and in which subject and object are one action and one flow, is the real present. When we conceive a material thing teleologically, directionally, it must have a center, and this center is the point of transformation of a self-conscious system, the point at which the system of matter meets that of spirit." See his Intuition and Reflection in Self-Consciousness, tr. Valdo H. Viglielmo (Albany : State University of New York Press, 1987), p. 127.

[18]Hans Waldenfels, Absolute Nothongness: Foundations for a Buddhist-Christian Dialogue, tr. J. W. Heisig (New York: Faulist Press, 1980), pp. 40-41, 45-46.

[19]San Hun Lee, Explaining Unification Thought (New York: Unification Thought Institute, 1981), pp. 6-7, 10.

[20]Ibid , pp. 11.

[21]Process and Reality: An Essay in Cosmology, corrected ed., ed. David Ray Griffin and Donald W. Sherburne (New York: Free Press, 1978).