14th Symposium on Unification Thought, Keynote speech

# Unification of Sciences and Unification Thought

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Most honorable and distinguished scholars, respected guests of this symposium on Unification Thought under the theme of *The Unity of Sciences and Unification Thought*, Ladies and Gentlemen:

It is a distinct honor for me to address you the topic *Unification of Sciences and Unification Thought* at the beginning of this very significant international symposium. In order to be here, you have taken time from your work and important schedules. I know this indicates your awareness that our world faces many serious challenges, and that it is our responsibilities to work together in the search for solutions to the critical problems we face today.

## 1. The Ideal of Unity of Science

Before mentioning the unity of science, we should be agreed on the definition of the word 'science.' As in earlier times we identify science with knowledge, that is, knowledge of facts and theory. It covers the natural sciences and the social sciences, as well as a part of humanistic studies. In all the sciences, the reach is for truth or true knowledge. As to the unity of the sciences, all the sciences have a unified goal in the pursuit of truth. Probably scientists have from the beginning of systematized science had the thought that it would be necessary for them to find some kind of unity, and for that purpose they have also made some kind of code of science.

The unity of science is surely an ideal which is present, consciously or unconsciously, in the heart of every scientist. The unity of science appeared as an ideal to strive for when physics and chemistry developed with immense rapidity in the 17th century. Newton already united the descriptions of two phenomena: the motion of objects falling to ground, with the revolution of the moon around our Earth and the planets around the sun. The successes of the physical sciences

raised the hope that ultimately the behavior of all objects could be described by the laws which can be obtained through the study of material objects.

After the Newtonian success, another profound unity established by modern physics was that of Einstein's relativity theory. A moving body becomes older at a slower pace than a resting body of the some kind. Space and time are thus intimately connected to the point of mutual convertibility at a fixed rate, which is measured by the velocity of light in vacuo. This new unity is one inseparable field called space-time.

Then, the emergence of field theories led to a unified treatment of electricity, magnetism, and light; quantum mechanics may be viewed as a formalism unifying the corpuscular and wave-packet aspects of physical reality. That part of quantum mechanics is referred to, which can be based on Schr□nger's equation, consistently with our knowledge of cosmic phenomena. Then, is there full unity in present day physics which deals, not only with phenomena which we can realize here on earth, but tries to account for events in the world at large, in the cosmos? Until now, the answer is 'no.'

The events between which Schrödinger's equation, that is quantum mechanics, describes correlations are fundamentally different from those of global physics, as embodied in the general theory of relativity. The events between which the theory of relativity establishes regularities are space-time coincidences. But, for microscopic physics, that is, quantum mechanics, space-time coincidences do not exist. Nevertheless, the physical scientist still goes in search of the unity or theoretical consistency between macroscopic global physics and microscopic quantum physics.

Beyond the physical sciences, the question of coherence within the sciences of psychology, anthropology, and also philosophy, in the Hellenistic era, is not easy to discuss. These fields are very different from the physical sciences. But I would like to present one model case based on Schrödinger. It appears that there is no role for life or consciousness within the field of the physical sciences. But quantum physicist Schrödinger, who is also one of the founders of molecule biology, searched for the problem of 'life' in respect of quantum mechanics. So, we could conclude that a greater unity of science is demanded not only by the present state of physics, but also by our general conceptions of science.

Moreover, I should like to stress the fundamental continuity or affinity between the intellectual man and the intelligible world, 'dead matter,' on one side and a 'divine soul' on the other. Matter is not stuff, and the spiritual is not ghostly. The former corresponds closer to the intensive, the latter more to the extensive dimensions of the world. We thus have to distinguish, but we must not separate. There will be some basic coherence. Science begins its research on visible and external things. However, science can also assist in understanding the frontiers of the invisible or internal things of the spiritual dimension. Thus, we must be able to have a central point located in the

external visible world connected to the internal dimension. Together they will revolve around each other in eternal give-and-receive action.

Rev. Moon asserted at the ICUS conference, "Today, in all fields people are prone to narrow their research to small and limited areas so that they tend to lose the overall purpose or the centrality of their subject. In order to integrate all the specific fields of research, we are in need of a larger design or blueprint. In this way we may have a common ideal before us as we proceed to achieve this integration. The main purpose of this symposium on ICUS is for us produce that blueprint. – Man is aware that he has life within him because his mind that originates from a source of the highest dimension is not limited to space and time. That source may be called true love or the *Shimjung* (心情) of the first cause of all beings. Man must be able to understand the centrality of absolute love in the cosmos in order to give his life meaning. We must not lose the very central point of the whole purpose."

## 2. Unity of Science in the Vienna Circle

The atomists were the first reductionists. Democritus' atomism, certainly very popular in his day, was plausible, not because of the mechanistic postulation of atomic discontinuities, but because of the assumption that a very small stock of accessible concepts like shape, size, and speed could in principle explain all change and all diversity in the natural world. It assumed that the most complex properties of life and mind could, in principle, be understood in simple quantitative terms.

The success of Galilean mechanics was the second attempt at reductionist materialism. In his view, Secondary qualities (like color and viscosity) could be explained in terms of Primary qualities (like extension and mobility, which warranted the application of mathematized mechanics). Thus the language of science would constitute no problem since it would ultimately reduce to a set of quantitative empirical concepts. In this view, the unity of science must be attainable because all sciences ultimately reduce to the most general science, physics, i.e., physicalism.

Such concepts would constitute the universal principle of the unity of science in the Vienna Circle. By making science a single enterprise, epistemologically speaking, the unity of science could be achieved. In the 1930's, an Institute for the Unity of Science was set up under positivist auspices. Its slogan, 'Unity of Science (Einheitswissenschaft)' was created by that living dynamo, O.Neurath, and was taken up by other members, in particular R.Carnap, H. Reichenbach, C.G. Hempel, P.Frank, the physicist P.Bridgman, the biologist G.Wald, the statistician R.von Mises, the logician W.V.Quine, psychologist B.F.Skinner, young linguist, N. Chomsky and various sympathizers of logical empiricism in England, Germany, Austria, Poland, France, and the United States. Each of whom was one of the foremost thinkers in his field and among the most creative minds of the era, and all supporting that unity of science.

They began publication of an 'International Encyclopedia of Unified Science' which would lay the foundation for a new methodologically unified approach to cognitive assertion generally. Things quickly began to fall apart. In 1953, with the publication of *Philosophical Investigations*, a different Wittgenstein from the one who had authored the *Tractatus* – a model of logical empiricism – became known to the world and soon caught the fancy of philosophy and the other fields of science. Moreover, logical empiricism came under increasingly severe attacks from all sides, mainly, from Popper and his followers.

The original thesis of the unity of science was based on the belief that all scientific concepts are definable in the strictest sense of language of sense-data by terms belonging exclusively to the positivistic language or, alternatively, the physical language. The question whether intensional and other non-extensional logics are reducible to extensional ones – a positive answer to which was for Wittgenstein and Russell a matter of deep logical conviction – was dealt with by the later Carnap. He originally formulated the *thesis of extensionability* as one of the mainstays of the Unity of Science. I myself translated *Meaning and Necessity*, one of Carnap's later works, into Korean, and it mainly deals with reducibility, and the formulation of extensional logics.

Today these claims of reducibility look rather naive. Most logical empiricists came to realize that most terms occurring in scientific theories are neither definable by, nor reducible to, the so-called observational terms of the everyday thing-language. The Institute for the Unity of Science has recently dissolved. That its aims have been achieved might well be doubted. The original positivist manifesto has been abandoned. Though many would still set up a methodological unity of science as a goal, the barriers to the unification of the natural and the social sciences are serious ones. These are matters of the most intense controversy among philosophers of science at present.

The word science was taken in the wide sense of disciplined inquiry that includes all of the natural and social sciences and the humanities. The study of science itself requires close attention to the various intertheoretical relationships; Chemistry is more than physics, biology is more than chemistry, psychology needs brain plus mind. Of course, the problems of reducing biology to physics, psychology to biology, or linguistics to psychology, though not considered by Carnap, etc., in their modern formulations, are intellectually more exciting than ever. If science is viewed as an ensemble of theories, the problem of the unity of science has traditionally been dominated by the idea of *reduction*, that is, upward causation, which means that theories about a higher ontological level can be reduced to a theory about a lower ontological level, which is the basis of the final cause.

However, contrary to reductionism, downward causation is also important. For example, knowledge about the cellular control of molecular activities may complement knowledge about the molecular control of cellular activities; that is, the higher cellular level controls the lower molecular level. As shown by N. Chomsky, the facts of language acquisition by children are better accounted

for by assuming a special innate faculty of language based on mentalism than by relying on behavioristic learning theory.

Through the movement of Unity of Science mentioned briefly above, we know that scientists have tried to carry out the task and ideal of science for a long time. To sum up the history of that movement from the viewpoint of Unification Thought, the first try to realize the ideal of Unity of Science along with the developing science was the movement of the School of Encyclopedia based on the philosophy of enlightenment in the seventeenth Century. They compiled an encyclopedia on the basis of empiricism of the philosophy of enlightenment and mechanical materialism, which is the predecessor of The Encyclopedia Britannica enhancing its reputation even today.

The second attempt was the movement of Unity of Science centering on Vienna Circle mentioned above. Two movements for the Unity of Science with the development of science did not play the leading role in realizing the unity of science. If I point out the causes of the failure from the standpoint of Unification Thought, it is that the philosophical foundation of the two movements was put on empiricism and materialistic philosophy. Rev. Moon introduces God to us using a metaphor as 'Scientist of Scientists, and Artist of Artists', which emphasizes the importance that the foundation of science, holding theistic presuppositions, should be placed on the basis of God and Godism, because all natural things and the practical world are created by God. Therefore, any science or scientific research cannot get its justification unless it is based on God. It is why, spending an enormous expense, Rev. Moon have established ICUS with intellectual elites in the world and proposed the quest of science centering on Absolute Value and the movement of Unity of Science.

### 3. Holistic Worldview of Sciences

The view of unification thought is neither dualism, nor spiritualism, nor materialism. It is unitism or a theory of oneness. Unification thought says that all being, resembling the Original Image, is the united body of *sung sang* (mind) and *hyung sang* (matter). *sung sang* and *hyung sang* must share something in common in order to perform give-and-receive action between themselves. Descartes's dualism doubted that two essentially different elements could assume a mutual interaction, but we can definitely say that there is a *hyung sang* element in the *sung sang*, and a *sung sang* element in the *hyung sang*. Their relationship is that of subject and object, i.e., dominating and dominated, with one taking the controlling and active role, and the other, the obeying and passive role. There is no harmonious give-and-receive action without the central role of *Shimjung* or true love. True love brings a united body between the subject and the object.

Following unification thought, I will survey the holistic view of the sciences. Holistic theory describes the world as an undivided whole. First, the forces of molecules, the entelechy of organisms, the soul of animals, and the spirit of human beings possesses collective qualities somehow related to those we have encountered in quantum theory, which is a profoundly general

science indeed. Quantum theory does not contain any antinomies. But there are startling paradoxes in view of the usual ontology with its strict regard for the separation of matter and mind, of the objective and the subjective.

In quantum mechanics, there are, everywhere, a great number and hierarchy of wholes that exceed the sum of their respective parts. This lesson has been dramatically exemplified by the quantum mechanical paradox of Einstein, Podolsky & Rosen. They demonstrated in 1935 that this state of affairs is consistent with laws of quantum theory: A compositive system $\Sigma=\Sigma_1\cdot\Sigma_2$ is in a maximally defined state:

$$\Psi = \Sigma_a \Psi_1^a \circledast \Psi_2^a$$

wherein the physical system $\Sigma$ is a whole unity which can be divided, by force, into its parts $\Sigma_1$ and $\Sigma_2$. But the proprietal state $\Psi$ of $\Sigma$ is an indivisible unity which cannot be separated intellectually into separate parts $\Psi_1$ and $\Psi_2$, in spite of the fact that the physical parts $\Sigma_1$ and $\Sigma_2$ are spatially and dynamically separated.

This remarkable individuality of atomic phenomena is not restricted to the smallest particles only; According to quantum theory, it applies to unities like molecules or organisms in an extremely interesting manner. The dynamical objectivity is combined with the informational subjectivity of this basic concept $\Psi$ of a probability amplitude. Physics and epistemology, i.e., objectivity and subjectivity, become essentially identical in the context of quantum theory.

Classical physics saw the world as a regular, deterministic clockwork, ruled by Newtonian laws. This view changed dramatically, even as far as classical mechanics was concerned, with the discovery of chaotic systems. These systems are so sensitive to small perturbations from outside that they cannot be meaningfully separated from the rest of the universe and their behavior cannot be predicted in detail. Prigogine showed that behind the chaos there is a new type of order. It is a spontaneous order, the order exemplified, for instance, by the delicate balance of regularity.

Current mind-brain theory no longer dispenses with conscious mind as just an 'inner aspect' of brain activity, or as some passive epiphenomenal, metaphysical, or other impotent by-product, as has long been the custom; nor does it reject consciousness as merely an artifact of semantics or as being identical to the neural events associated with it.

Consciousness, in these revised terms, becomes an integral, dynamic property of the brain process itself and a central constituent of brain activity. Subjective experiences is viewed in R.W.Sperry's operational terms, as a causal determinant in brain function and acquires emergent

control influence in regulating the course of physical-chemical events in brain activity. In a sense, mind moves matter in the brain just as an organism controls its component organs and cells, or a molecule governs the molecular course of its own electrons. The conscious mind as reinstated in the brain of objective science and scientific theory is squared with common sense on the mind-controlling-behavior issue.

**4. Sciences and Values**

Facts and values are two categories not easily related. There is always a logical as well as a real gap between *is* and *ought*: between demonstration and vindication. General acceptance of the inadequacy of science in the realm of ethics and moral judgments is reflected in the old adage that 'science deals with facts, not with values.' and its corollary that 'value judgments lie outside the realm of science.' In other versions it is stated that science may tell us *how* but not *why* or that science may show us how to achieve defined goals, but not what those goals should be; science *describes* but cannot *prescribe*.

It seems that science as a discipline must by its very nature operate in the realm of objective fact and that science, as a method, can neither formulate value standards nor resolve issues in the domain of subjective value. This traditional separation of science and values and the related limitations this has implied for science as a discipline are no longer valid in the context of current mind-body theory. Human values can also be viewed objectively in scientific terms as universal determinants in all human decision-making. All decisions boil down to a choice among alternatives of what is most valued.

The importance of value issues is apparent also in another area, the so-called brain problem. The human brain comes equipped in advance with established value determinants and with inbuilt logical constraints that have their origins partly in biological heritage, partly in prior experience and may even arise through formal acceptance of ethical axioms. In practice, therefore, it is not a question of deriving values from the facts *per se*. Incoming factual information interacts as a co-function with intrinsic cerebral value determinants in the building of one's sense of value. Along the above lines, progress could be greatly speeded on many fronts if we can clearly recognize that science deals with values as well as with facts.

Any given brain will respond differently to the same input, and will tend to process the same information in quite diverse ways depending on its particular value system. In short, what an individual or a society values determines very largely what it does. Values and other mental phenomena, though built of neural events, are no longer conceived to be reducible to, nor identifiable neither with, those events, nor to mere paralleled correlates.

This view of the unity of science and knowledge does not simply reduce all knowledge to a single academic discipline. Instead, it is a unity grounded in a fundamental purpose. By attempting

to be value-neutral, science has often excluded the questions of humanity and moral values in the progress of its development. Another reason for the demise of value and morality is that past standards of value and morality no longer satisfy modern minds. New reasonable morals and ethics must arise out of a new standard of values. This standard can be derived only from a transcendent, unified system of thought that unifies science.

Rev. Moon has said, "I view the original character of science as embodying in unity the two sides of spirit and body, resembling man. This means that science should assume a unified character dealing also with the field of moral value. Therefore, to establish a true standard of value for the common benefit and welfare of mankind we cannot but set up as the standard a universal and absolute element that can be the central purpose of all humanity."

The essence of this absolute standard should be true love, which forms the basis of the system of ethics and values. It also forms the basis of all existing beings. I believe that this direction and standard of value can come only from God-centered thought. I maintain that the absolute values we seek are grounded in the absolute true love of God. Solutions to the world's problems can come about only through this holistic approach to human existence.

### 5. The Logical Foundation of the Unity of Science

Briefly, I'd like to introduce unification logic in order to search for the foundation of the unity of science. Logic and mathematics are clearly very different from the other sciences: they appear to describe, or be based on abstract arguments. It is generally admitted, that they act intuitively based on their application in the other sciences – which does serve marvelously. Logic is concerned with laws of human thinking and scientific reasoning. Thinking proceeds in the direction of realizing the purpose of human beings, and the purpose is fundamentally rooted in the Heart, or *Shimjung* in the view of unification thought. Because thinking has a direction towards the object, cognition and thinking necessarily involve the subject's action towards the object in order to realize its purpose.

The logical structure of human thinking resembles the logical structure of the Original Image in principle. The direction to realize the purpose rooted in the Heart shapes a plan through thinking resulting from the mutual relationship and unity of the two elements, that is, intention(the directional structure of the rational faculty) and its corresponding concept. The logical structure of this four position foundation is not formed by experience but through an innate, *a priori* process, although experience is not wholly excluded in its making. In fact, without experience of daily life, we cannot explain the interaction of the logical structure and the practical structure.

Aristotle's attempt is the first to construct a system of all sciences based on formal logic. Science in his view must rest on first principles, themselves necessary truths, certified as true by the skilled insight of the philosopher-scientist. From these as premises, deductive logic can generate

demonstrative science, in which the more specific conclusions appear as necessary truthes. Lacking such principles, there is no way in which an eternal and necessary science could be constructed.

Aristotelian logic provided a tight deductive and conceptual unity of science, since all conclusions have to be implicit within the premises with which the deductive inference begins. Particularly, the formal logic of Aristotle has been regarded as self-evident truth. But, is it really so? If logic aims at setting the foundation for a proper scholarship of the sciences, it must be admitted that the foundation of the 'formality' in formal logic is weak. This is because we cannot assert the universality of the sciences from the abstract 'formality,' which originated in empirical positivity.

Unification Logic recognizes the *a priori* sphere of subjective conditions as the foundation of the possibility of such positive experiences and as that which controls all empirical conditions. Accordingly, from the viewpoint of Unification Logic, the foundation for proper sciences can begin neither with empirical 'positivity' alone nor with the subjective *a priori* alone. It is Unification Logic, which is being promoted as an alternative to formal logic, which has been the basis of most academic endeavors.

As seen above, Aristotle's deductive logic could not become the universal principle to establish the foundation of metaphysics and science. From the viewpoint of Unification Thought, the system of formal logic of Aristotle is literally formal system, which is a vacant logic system to tell nothing about the empirical essentialities and empirical science, which can become the basis of science. To establish an eternal and necessary foundation, as Aristotle mapped out, the deductive motive coming from the mind, sphere of *sung sang*, and the inductive motive of the level of experience, that is, sphere of *hyung Sang* should be under consideration. In Unification Thought, when these two motives, that is, deductive motive and inductive motive, are under consideration in the sense of subjective and objective, the basis of true science can be secured.

Kant saw no way of explaining the universality and necessity of the law of Newtonian mechanics, Other than that he supposed that the source of this universality and necessity lay in the human mind itself. As seen from Hume's inductive argument, no particular sense could of itself achieve the certitude of universality and necessity. The mind constructs in advance, for example, the categories of a 'pure physics' of synthetic *a prior* truth. Kant was forced to look carefully at the mind's power of projecting its own structures into the objects of scientific inquiry.

From the viewpoint of Unification Thought, the typical example of the universal principle which can be a basis of science is the principle of interaction of give and receive. Science is a process of seeking truth to try to explain an individual experienced facts through a general and universal principle. Accordingly, the work to establish science cannot be achieved in the sphere of experience nor in the sphere of mind either. Because the dimension of mind and the dimension of experience is matching in the reciprocal relationship of subjectivity and objectivity.

So, neither of them can regulate the other. The unique principle to work between both parties is the principle of give-and-receive. If you seek for the principle of regulation in mind only, the empirical world is nothing but a chaotic various collection of sense data. If that is so, isn't the mechanic law of Newton applied in this world realistically? Are all those laws subjective mind laws?

Unification Epistemology maintains that man's subjectivity is involved in cognition. Of course, the sensible qualities of the object, also, are necessary for cognition to take place. Accordingly, as the general principle that science seeks for appears in the mind as the law of presentation and practical law in the world of experience, which are regarded to have a relationship of subjectivity and objectivity. From the viewpoint of Unification Thought, our subjectivity is able to have cognizance of the physical law of the practical world for the first time. In this respect, Unification Thought stands above Kant.

May your intense discussions during this symposium be successful and most fruitful. I pray for God's protection and blessing to be with you and your families and your nations.

Thank you very much.