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THE PLACE OF PHILOSOPHY IN THE INTERACTION BETWEEN THEOLOGY AND SCIENCE

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Abstract:
Being in its totality constitutes the domain of philosophy. Truth and beauty are transcendental properties of being, and are convertible. Truth is the perception of beauty in the intellectual order, and Aristotle articulated the beauty inherent in this expression with the simplicity of genius itself, when he stated, at the beginning of the *Metaphysics*, that all men by nature desire to know. The material object which lies at the basis of all the fields of human knowledge is being. However, it is the formal object that distinguishes one field of knowledge from another, thereby giving each field of knowledge is own sphere of fundamental intelligibility. "*The Place of Philosophy in the Interaction between Theology and Science*" examines the sphere of fundamental intelligibility inherent in these different fields of knowledge, by raising the question of "theology" and the question of "science," it pays attention to the interaction that exists and could exist between "theology" and "science," and the challenges within the context of this interaction. The contention of this paper is that in the interaction between Theology and Science, a *warfare* paradigm characterized by conflict and antagonism need not be accepted as the paragon demonstrative of ideological innocence, rather, with greater analytical awareness, the "warfare model" in the relationship between theology and science must be superseded. The insight offered by the interaction between theology and philosophy in the understanding of the Logos, as the foundation of the universe gives further insight into the order of the universe and the logic of science. Wisdom is the greatest perfection of the intellect. It is the place of wisdom to provide order, very significantly therefore, it is important to examine the place of philosophy "as the love of wisdom," in the exploration of the various degrees of eidetic perception and intellectual visualization in relation to different modes of knowledge,

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and the models of interaction between them. Each discipline has its specific methodological framework; therefore it is a disservice to truth and wisdom to confuse the distinctive methodological frameworks peculiar to different modes of knowledge. The goal is the achievement of creative insight in relation to new ideas in the interaction between these modes of knowledge and the advancement of human culture and development.

Keywords: philosophy, theology, science, methodological framework, fundamental intelligibility, interaction, wisdom, eidetic perception, creative intelligence, culture and development

1. Introduction

In a celebrated statement, Albert Einstein once affirmed: "*I want to know how God created this world. I am not interested in this or that phenomenon in the spectrum of this or that element. I want to know his thought. The rest are details*" (202). Prescinding from whatever, intellectual and theological hypotheses that could be made with the expression "God" there is the undeniable fact, that there are profoundly beautiful petals of wisdom in these remarks. In the light of these beautiful words of wisdom, the core concern would be the examination of the place of philosophy in the relationship between theology and science.

In the light of the perennial philosophical quest for wisdom, the insightful remarks made by Immanuel Kant in the *Prolegomena*, could provide us with an introductory point into this discussion: "*Human reason so delights in constructions, that it has several times built up a tower and then razed it to examine the nature of the foundation. It is never too late to become wise; but if the change comes late, there is always more difficulty in starting a reform*" (Kant, 2). It is never too late to become wise, this is of great importance for philosophy. The motivating factor is the love of wisdom. In this paper entitled: "*The Place of Philosophy in the Interaction between Theology and Science*" we would pay attention to the question of theology, the question of science, the question of philosophy and the place of philosophy in the interaction between theology and science. Bearing in mind the beautiful words of Pope St. John Paul II "*Faith and reason are like two wings on which the human spirit rises to the contemplation of truth..."* (1) Being in its totality constitutes the domain of philosophy. Truth and beauty are transcendental properties of being, and are convertible. Truth is the perception of beauty in the intellectual order, and Aristotle articulated the beauty inherent in this expression with the simplicity of genius itself, when he stated, at the beginning of the *Metaphysics*, *that all men by nature desire to know* (980a).The material object which lies at the basis of all the fields of human knowledge is

being. However, it is the formal object that distinguishes one field of knowledge from another, thereby giving each field of knowledge is own sphere of fundamental intelligibility. The goal is the quest for truth. In the love of wisdom the supreme part is truth. Truth liberates. This can contribute towards the flourishing of the different branches of knowledge, co-operation among the fields of learning, authentic human development, cultural and educational advancement and nation building.

2. The Question of Theology

The question of theology has to be situated within the overall context of the question of religion. In its etymological derivations, the expression "religion" tends to have multifocal and contentious etymological roots. We will limit ourselves to only two. Religion has the etymological derivation from "religare" which basically means "to bind together," with the understanding that religion is the bond of connection between the natural and the supernatural, the human and the divine. The second is "relegere" in the sense of "re-reading," "treating carefully," in relation to reference and respect towards the divine. Religion involves the divine, the human and the universe. It involves an organized system of belief about the divine, the human and the universe. The intellectual reformulation and systematic expression of religious faith could be understood as a form of "theo-logos."

For a proper understanding of theology some knowledge of the term is demanded. Etymologically, the expression "theology" is derived from the combination of two Greek words: "*theos*," God and "*logos*" reason, discourse, or study. This means that theology is basically the discourse about God. God is the primary object of theology. Theology deals with the question of God, God's revelation and all things in relation to God. God and God's revelation provide the basic dimensions of theology and the task of theology (Von Balthasar, 157). Theology then deals with the question of God, and with all things in terms of God as they are relative to God as their foundation and end (Aquinas, 1a. q.1. a7 ad.2.).

> *If "God" is to be understood as the all-determining reality, everything must be shown to be determined by this reality and to be ultimately unintelligible without it…Theology as the science of God would then mean the study of the totality of the real from the point of view of the reality which ultimately determines it both as a whole and in its parts.*
>
> (Pannenberg, 302-303).

Theology then is fundamentally a discourse on divine intelligibility. Theological discourse is a discourse about God, which is fundamentally a human activity, in the

quest for the intelligibility of the all-determining reality. When theological discourse, designates that God is to be understood as the all-determining reality, then everything must be seen in the light of this reality.

> *God is the first reason of things: for such things as are bounded, as all that which we see and experience, are contingent and have nothing in them to render their existence necessary, it being plain that time, space, and matter united and uniform in themselves and indifferent to everything might have received other motions and shapes, and in another order.*
>
> (Leibniz, *Theodicy*, 127)

In the task of theology, it is the human person who does theology, who carries out the discourse on God; consequently, "theological activity" has a place in human life and understanding. Theological studies would also attempt to have an insight into the meaning of human existence and the nature of reality and the origin and the goals of existence. It will also seek for understanding of the ethical behaviour of persons in the world and what lies before birth and what lies beyond death. It implies a quest into the question of the ultimate meaning of existence.

A fundamental problem in the study of theology is the issue of revelation. And if the foundational issue in theology is expressed in terms of the contents of revelation by a Divine Being, are the contents of such revelation also available to the philosopher as material for valid philosophical reflection and analysis? In the face of the multiplicity of faith traditions, religious communities and theological doctrines: what would constitute authentic revelation for the philosopher and how can this be validated?

Furthermore, if theology is to be an academic discipline, will this "discipline" be exercised by theology in itself as an autonomous subject or will this discipline be exercised from outside, for instance from religious communities or ecclesial or political authorities as "external discipline"? Will theology be able to carry out the critical function of an academic discipline without hindrance from external authorities or must it bow to the demands of external authority, losing its autonomy and becoming something of an instrument of ideology? Whether this be religious ideology, ecclesiastical ideology, cultural ideology, social ideology or political ideology?

> *This may be significant for our inquiry concerning the relationship between faith and philosophy insofar as it reminds professional philosophers and theologians that they are expected to provide something transcending all erudition, namely, an answer to the great questions of life, such as, what is human existence really about? Or what must we do to live our lives successfully? I think that we must not lose sight of this appeal as we pursue*

our investigation, because it contains an actual glimpse of the element which binds philosophy and theology together.

(Ratzinger, 15-16)

The intellectual challenge remains whether philosophy and theology can still enter into any kind of mutual relationship at the level of methodological analysis. However, the question of such a possibility is contested on both sides of the divide with serious arguments. For instance a person like Martin Heidegger maintains that philosophy is by nature a questioning. Whoever believes that he has the answer already, by way of revelation is no longer capable of *philosophizing*. On the other hand, Martin Luther believes that the incorporation of philosophy into theology automatically destroys the message of grace, hence the gospel itself in its very foundation (16-17). In this work, for the sake of precision in knowledge it would be important to limit our primary focus to the question of Christian theology, though not in an exclusive manner.

3. The Question of Science

Etymologically, the English word science is derived from the Latin expression ***scientia***, which basically means knowledge. The Latin ***scientia*** has its roots in the verb ***scire*** which basically means to *know*, to *discern*. *Scientia* basically means knowledge; fundamentally, ***science could be understood as a systematically organized body of knowledge***. Scientific knowledge involves the quest for truth and some of the tools essential for this quest include ***rationality***, ***objectivity***, ***experimentation*** and ***verifiability***, and falsifiability. ***The experimental sciences could be understood basically as knowledge of the world of nature.*** In general terms the natural sciences are neutral towards theology, they do not require a prior or consequent acceptance of any theological belief (McGrath, 1). Generally, from a more empirical perspective, science could also be understood as the systematic study of anything that can be observed, experimented upon, examined through a variety of tests and open to verification or falsification.

A scientist whether theorist or experimenter, puts forward statements, or systems of statements and tests them step by step. In the field of the empirical sciences more particularly he constructs hypotheses and or systems of theories, and tests them against experience by observation and experimentation.

(Popper, 27)

The modern and contemporary perception of science has become markedly different from the classical understanding of science, the scientific perception in modernism and postmodernism, has brought about an understanding of science, which has serious implications for science itself, as well as for theology and philosophy. Scholars both modern and ancient always had a preferential option for Mathematics as ideal representative of "scientific knowledge," but even in this context, to raise the question of the nature of mathematics and the question of the nature of numbers, is a "meta" activity which belongs appropriately to the realm of philosophy.

> *The great foundation of mathematics is the principle of contradiction or identity, that is, that a proposition cannot be true and false at the same time, and that therefore A is A and cannot be not A. This single principle is sufficient to demonstrate... all mathematical principles.*
>
> (Leibniz, Philosophical Essays, 321)

In general a science involves a pursuit of knowledge concerning general truths or the operation of fundamental laws. Technology, from "techne" and logos" involves the application of scientific knowledge to the practical aims and challenges within the context of human life. Beginning from its earliest origins, entanglements with philosophy and complex history, science has developed into one of the greatest and most influential fields of human endeavour.

> *The characteristics of a science may consist of a simple difference of object, or of the sources of cognition, or the kind of cognition, or perhaps of all three conjointly. On this therefore, depends the idea of a possible science and its territory.*
>
> (Kant, Prolegomena, 13)

Today different branches of science investigate almost everything that can be observed or detected, and science as a whole shapes the way we understand the universe, our planet, human beings, and other living beings. The classification of scientific knowledge is a complex task. Robert Burch in his presentation of Peirce's classification of the sciences indicates that "*As with many of Peirce's classificatory divisions, his classification of the sciences is a taxonomy whose tree is trinary. For example he classifies all the sciences into those of discovery, review, and practicality*" (Burch, https://plato.standford.edu/archives/win2014/entries/peirce). Michel Bourdeau, in his presentation of the classification of the sciences especially from the positivistic perspective expressed by Auguste Comte, indicates that the classification of the sciences represents an important development in the hierarchical arrangement of human

knowledge. "*This classification… examines each of the six fundamental sciences – mathematics, astronomy, physics, chemistry, biology, sociology…it provide a way to do justice to the diversity of the sciences without thereby losing sight of their unity*" (https://plato.standford.edu./archives/win2015/entries/comte).

Classifying sciences involves complex and at times arbitrary decisions, but for the sake of brevity, scientific knowledge could be seen from at least five broad perspectives which include: the formal sciences, the physical sciences, the earth sciences, the life sciences, and the social sciences. These broad perspectives and branches of scientific knowledge consists of various divisions and subdivisions with interdisciplinary perspectives they combine overlapping disciplines, creating yet more areas of complex research and scientific knowledge. The emphasis here is not in the minutiae.

However there are challenges and controversies with regard to the classification of the social sciences as "science." This challenge calls attention to the fact that the legitimacy of extending the methods and categories of the physical sciences to human behaviour remains questionable. Can the methods and categories in the realm of nature be extended to the unpredictable reality of freedom – which is a distinctive characteristic of human persons? Some psychologists and sociologists insist that human actions are subject to laws and mechanisms just like physical processes, but others maintain that there is no such rigid connection. What happens to the dynamic, developing character of human persons and social structures? Economics has exemplified itself as the most mathematicized of the Social Sciences. Among the Social Sciences, Psychology is the discipline that continues to maintain the closest link to philosophy.

Renaissance Humanism expressed itself as a bifurcated movement – from one perspective it was a movement towards the recovery of ancient knowledge, while from another perspective it was a movement of discovery of new knowledge especially in the area of the emerging empirical sciences with new tools of observation and measurement. The movement for the recovery of ancient knowledge was in the arts and humanities while the movement for the discovery of new knowledge by looking more attentively at nature, was in the sciences and the practical application of science in technology.

In the view of Pope St. John Paul II, the development of science and technology also demand a proportional development of human morality and ethics (*Redemptor Hominis*, 15) This deserves equally great attention especially as it pertains to the area of biotechnology; as well as the area of arms, be it biological, chemical, atomic or nuclear arms. There is need that every aspect of human scientific as well as technological

advancement should go with a corresponding sense of human dignity and responsibility, in searching for the truth and the good of the human person.

4. Interaction between Theology and Science

A purposeful point of entry for this part of our enquiry will be to begin with the work of a person like Andrew D. White, *A History of the Warfare of Science with Theology in Christendom,* 1896 a *warfare* model characterized primarily by conflict has become representative of the relationship between theology and science, this came to represent the popular conception that science and theology are antagonistic in the quest for truth. The thesis of White should not be accepted as a paragon demonstrative of ideological innocence. The thesis promulgated by Andrew D. White, points to the fact that much of what he presented as historical facts were profoundly ideological arsenals dressed up in the apparel of historical facts. With greater analytical awareness, the "warfare model" in the relationship between theology and science must be superseded. The thesis that we are sustaining in this work is that there could be interaction between theology and science in the quest for truth. In doing this we are not ignoring the question of the tension that has existed in the relationship between theology and science.

> *The confusion and tragedies caused during the Renaissance by a theology that wished to prevent the earth from turning and a decadent Aristotelianism which decreed that it was wrong for the telescope to see spots on the sun, have put the scientific world on guard most rightly against all dictatorship of this kind.*
>
> (Maritain, Science, Philosophy and Faith, 29)

What we intend to propose is that truth should be the guide. Within the context of the development of the idea of the University in the Western World, Theology came into contact with other branches of learning and knowledge including the natural sciences. The theological worldview that was promoted by the Christian religion contributed immensely towards the development of science itself. It was not a pantheistic worldview, nor and aggressively hostile worldview, it was a worldview, in which the world was understood to be the creation of the infinite God, who is the source of all wisdom. The insight offered by the interaction of Biblical faith and Greek culture in the understanding of the Logos, as the foundation of the universe and the binding force of the whole of creation, gave impetus towards the exploration of the universe and a firm belief in the order of the universe and the logic of science. A further insight is that another fruitful area in which this interaction should take place most significantly should be in the area of research with regard to the question of the origin

of the universe. The question of the origin of the universe remains a valid question for theology, a valid question for science and a valid question for philosophy, especially pursued through the perspective of a diversity of disciplines though with different methodological frameworks. Robert Jastrow a leading NASA (National Aeronautics and Space Administration) scientist, physicist and astronomer, founding director and head of NASA's Goddard Institute for Space Studies once stated:

> *It is not a matter of another year, another decade of work another measurement, or another theory, at this moment, it seems as though science will never be able to raise the curtain on the mystery of creation. For the scientist who has lived by his faith in the power of reason, the story ends like a bad dream. He has scaled the mountains of ignorance; he is about to conquer the highest of peaks; as he pulls himself over the final rock, he is greeted by a band of theologians who have been sitting there for centuries.*
>
> (115-116)

The thesis that is sustained here is not one that advocates for the collusion of the boundaries of these distinctive modes of knowledge, but one that advocates for the promotion of the interaction between these distinctive modes of knowledge in the quest for truth. It is also our affirmation that philosophy can have a place in this interaction in the quest for the truth. There is need then for epistemological justification with regard to the question of scientific knowledge and the theoretical constructions that underlie collection and interpretation of scientific data.

5. Distinctive Methodological Frameworks

The English expression method is derived from the Greek μέθοδος, which is a combination of two words μέθά and όδός which indicates a systematic way of doing things in order to arrive at the requisite goals. Methodology μέθοδος and λογος involves a body of rules and postulates, a set of procedures employed by a particular discipline in its field of enquiry. In the context of our purposes here, by "method" of a branch of knowledge, it is important to bear in mind two very significant meanings. Primarily, this may refer to the technique of investigation, the principles of the procedure used in developing and enlarging a specific discipline or branch of knowledge. Secondly, a further meaning of the expression "method" refers fundamentally to what could called the logic of proof of a specific discipline or branch of knowledge (Caldin, 135). Theology and Science are two distinct branches of knowledge and the methodological framework that characterizes these branches of knowledge are distinctively different. Any attempt at creating a melange of these

distinctive methodologies, would only create confusions and conflicts that would obliterate the distinctive autonomy of these branches of knowledge. But as autonomous disciplines these different branches of knowledge can seek to interact with one another, learn from one another and strengthen each other in the quest for truth. The place of philosophy as the love of wisdom would be significant in this interaction, based on the fact that philosophy already has a distinctive relation with these different branches of knowledge. In this regard we would now turn attention towards the examination of the question of philosophy and the place of philosophy in the interaction between theology and science.

6. The Question of Philosophy and the Place of Philosophy

One of the most difficult questions in the whole of philosophy is the question that philosophy poses to itself about itself, namely the philosophical enquiry to the question: "What is Philosophy?" Perhaps very few academic disciplines, if any might have such an arduous task of defining themselves, and specifying their material and formal objects as philosophy. If we may go by way of etymological definition, the expression philosophy is basically a combination of two Greek words, "Philos" *love*, and "Sophia" *wisdom*, thereby indicating that philosophy is the love of wisdom. But this simple etymological rendition raises a further problem: "What is Wisdom?" and "How may one love wisdom?" How does wisdom stand in relation to knowledge? Are there situations in which there is much knowledge but little wisdom? For starters, it is important to affirm that every aspect of human life and experience, scientific or theological is open to philosophical enquiry and knowledge in the perennial quest for wisdom.

As the love of wisdom, philosophy seeks to give a synthesis to human knowledge. All our knowledge according to Kant begins with experience (*Critique of Pure Reason*, B1). However though all our knowledge begins with experience it does not end there. Our knowledge that arises immediately out of experience Kant refers to as ***a posteriori*** knowledge while ***a priori*** knowledge is that which stands in opposition to empirical knowledge ((*Critique of Pure Reason*, B3). The Kantian transcendental analysis of *a priori* knowledge indicate that:

> *By way of introduction or anticipation we need only say that there are two stems of human knowledge, namely sensibility and understanding, which perhaps spring from a common, but to us unknown, root. Through the former objects are given to us; through the latter they are thought.*
>
> (Critique of Pure Reason, A 15, B29)

From the Kantian philosophical perspective, *to think* an object and *to know* an object are by no means the same thing. Knowledge involves two factors: first, the concept, through which an object in general is thought by means of the categories, and secondly by means of the intuition through which it is given. The *a priori* of space and time constitutes the conditions under which reality is received.

> *All our knowledge starts with the senses, proceeds from thence to understanding, and ends with reason, beyond which there is no higher faculty to be found in us for elaborating the matter of intuition and bringing it under the highest unity of thought.*
>
> (*Critique of Pure Reason*, B355)

For Kant the ideas of pure reason are concerned therefore with the synthetic unity of all conditions in general. The thinking subject is a matter of psychology, the science of the soul, the conditions of appearance is a matter of cosmology and the conditions of all objects is a matter of theology, a transcendental knowledge of the ultimate reality, God.

> *Pure reason thus furnishes the idea for a transcendental doctrine of the soul (Pschologia rationalis), for a transcendental science of the world (cosmologia rationalis), and, finally, for a transcendental knowledge of God (theologia traszendentalis).*
>
> (*Critique of Pure Reason*, A 334, B391)

Beyond this classification of philosophy given by Immanuel Kant, the expression "Philosophy of..." could be used in almost all areas of human knowledge and experience, in such a way that it is possible to speak about the philosophy of various aspects of human knowledge. These include: Philosophy of Nature, Philosophy of Science, Philosophy of Mathematics, Philosophy of Physics, Philosophy of Biology, Philosophy of Medicine, Philosophy of Education, Philosophy of Engineering, Philosophy of Economics, Philosophy of Sociology, Philosophy of Politics, Philosophy of Art, Philosophy of Technology, Philosophy of Religion, Philosophy of History, and Philosophy of Law. The list is representative rather than exhaustive.

The remarks made by Ernest Nagel, in his "Naturalism Reconsidered" could help us in situating the place of philosophy in the interaction between theology and science. "*Philosophy at its best is a critical commentary upon existence and upon claims to have knowledge of it; and its mission is to help to illuminate what is obscure in experience and its objects...*" (751). There are claims of knowledge in both theological studies and scientific studies, however "claims to knowledge cannot ultimately be divorced from an evaluation of the intellectual methods used to support those claims (Nagel, 753). "Philo-

sophia" as the love of wisdom, must also be in a profound sense, a "philia" that is pro-episteme. There is need then for philosophy to carry out the epistemological task in the analysis of scientific and theological discourse, in the evaluation of claims to knowledge, the assessment of the various types of human experience and the evaluation of intellectual, ethical and aesthetic judgements. There is need for the philosophical task of the dedicated exercise of reason towards the realization of excellence in all things; it is an insult to intelligence to demand to proceed in the different fields of knowledge in an identical manner.

> *A comparison of theology with natural science reveals striking differences in every aspect – data, method, and conclusions. The data of natural science are of a kind verifiable by all; those of theology include revealed statements which are beyond the reach of unaided human effort, and are believed only on the ground that they are of divine origin. The method of natural sciences involves induction; that of theology involves reflection. The conclusions of science explain the data in terms of general statements; those of theology systematize the data in terms of the action of causes.*
>
> (Caldin, 153)

In the light of their distinctive methodologies, theological conclusions could be arrived at independently of science and scientific conclusions could be arrived at independently of theology. The two branches of knowledge are autonomous. The approach, by way of the distinctive methodological frameworks appears to be a fruitful aspect in building up an interactive model, distinguishing these different fields of knowledge and examining the interaction that could exist between them. *There is need to raise the question: what sort of knowledge is inherent in these disciplines, and what could be their role in education, in human scientific, theological, intellectual, personal, social, cultural, and political development? And by inference too what could be their influence in our national development especially with regard to human religious development, human cultural development and human scientific development?*

In dealing with this question, the constructive and critical tasks of metaphysical, ethical, and epistemological justification emerge as responsibilities that the philosopher cannot ignore. The philosopher is not called to be a "universal scholar," but he is called to the task of constructive and critical examination and re-examination in the spirit of the Socratic Method, in the firm understanding that just as the *unexamined life is not worth living*, the unexamined knowledge too, is not worth cultivating. The material object which lies at the basis of all the fields of human knowledge is being. However, it is the formal object that distinguishes one field of knowledge from another, thereby giving each field of knowledge is own sphere of fundamental intelligibility (Maritain,

Degrees of Knowledge, 37). Philosophy is the love of wisdom and the love of wisdom calls forth for intelligent perception and order, which in turn demands discipline, logical reasoning, critical analysis, constructive thinking, and creative insight.

7. Towards A Conclusion

Human persons, right from the dawn of philosophy in ancient Greece, have sought to organize knowledge in an orderly and systematic form. This order is clear in the classification of knowledge into the ***Quadrivium*** of Arithmetic, Geometry, Music and Astronomy. This classification is also seen in the ***Trivium*** of Logic, Grammar and Rhetoric. Also significant was the classification of knowledge into the speculative sciences of Physics, Mathematics and Metaphysics, especially as expressed by Aristotle in his *Metaphysics* (1064b).

All scientific knowledge must have some degree of abstraction and intellectual visualization. At the first degree of intellectual visualization and abstraction, we can have two disciplines which are distinct in nature. At this level of abstraction we can have the philosophy of nature which is basically ***ontological*** in character and the science of nature which is basically ***empiriological*** in character. The philosophy of nature seeks to understand the intelligibility inherent in the ontological structure of material beings. The science of nature deals with the empirically ascertainable quality of things as observable and sensible and which could be subjected to measurement and experimentation. The natural sciences deal with being as *mobile* and *sensible*. For instance, physics examines the phenomena in which physical energy is manifested; chemistry investigates the chemical constitution of things. These scientific investigations are not concerned with the ontological structure of beings. The question of being is simply not amenable to *empiriological* methodology and analysis.

Philosophy of nature as a branch of philosophy, links philosophy to the sciences of nature. Metaphysics as a branch of philosophy links philosophy to theology. The philosophy of nature draws its abstractive principles from metaphysics, the branch of philosophy that deals with first principles and ultimate causes. The sciences of nature draw their abstractive principles from Mathematics. In Aristotle, the purely philosophical and the purely descriptive and experimental went together to form a coherent body of scientific knowledge about nature. But this integral vision of Aristotle caused difficulties at the beginning of the modern era over the study of nature as a philosophical discipline and the study of nature as a scientific discipline.

Descartes, who set in motion great epistemological upheavals in philosophy, regarded his studies on rainbows and meteors as a philosophical treatise. Isaac Newton (1642-1727), titled his magnum opus which was published in 1687: ***Philosophiae***

Naturalis Principia Mathematica, *Mathematical Principles of Natural Philosophy*. However, this was a new physics, a new physics that applied equally well to terrestrial bodies as well as to celestial bodies. In the light of Newtonian physics, Copernicus, Johannes Kepler and Galileo were all justified. Newton's laws of motion and his principles of universal gravitation were sufficient towards the regulation of the cosmos, but Newton believed, only with the help of God (Williams, 38). Even within the context of scientific knowledge there was need for a transcendent theological opening.

> *Faith in the ultimate rationality of the creator or governor of the world could actually stimulate original scientific work. Kepler's laws, Newton's absolute space, and Einstein's rejection of the probabilistic nature of quantum were all based on theological not scientific assumptions.*
>
> (Williams, 32)

With the expansion and growth of human knowledge, there is need for specialization in the various branches of knowledge, and it becomes increasing difficult for any individual person to be the "universal scholar" in all the specialized fields of human knowledge. It is important for philosophy to undertake the epistemological responsibility in the interaction between the mode of knowledge which is theological and the mode of knowledge which is scientific, ultimately in the service of truth. The evolvement of philosophical studies corresponding to the various fields of human knowledge is important for the significant task of synthesizing, explaining and giving a logically coherent view of the ever-expanding field of human knowledge. The human being is a person precisely by virtue of his rational nature, and philosophy as a rational discipline is called upon to exercise this important task of giving a coherent view to human knowledge. Every aspect of human knowledge and experience, be it theological knowledge or scientific knowledge is open to philosophical interpretation and analysis.

The tensions that may exist in the various fields of human learning could also be an expression of the tension that exist between essence and existence, the universal and the particular, the present and the future, the abstract and the concrete, the finite and the infinite, the eternal and the temporal, the transcendent and the immanent. Philosophy could help us in achieving a more coherent worldview and a better understanding of some of these tensions within the context of human experience and knowledge.

> *For sensitive interpreters of phenomena, the ultimate intelligibility of nature has seemed to demand some rational guiding spirit. A notable expression of this idea is Einstein's*

statement that the wonder is not that mankind comprehends the world but that the world is comprehensible.

(Williams, 32)

In the task of comprehending the world, there is need for dialogue and interaction between the various fields of knowledge, including scientific and theological knowledge. There is need for a dynamic epistemology with an openness towards the development of a multidisciplinary methodology towards the transformation of education and the culture of learning.

Specialization and departmentalization in the realm of science, as they approach infinity make of the scientist competent in a fraction of a part of knowledge, an ignoramus before all other things, more of a stranger in the vast world than primitive man with his infantile mythology. Each one's conceptual equipment and vocabulary become incommunicable and we thus become strangers to each other; human thought enters the confusion of Babel. If it is to emerge from this confusion, and if conversation and collaboration are to be resumed among workers in the various scientific fields, it can be only on condition that the value of the higher disciplines be recognized anew; that a valid critique of knowledge and a valid philosophical training enable the theologian and the philosopher to listen to science, and the scientist to listen to philosophy and theology, and finally that science and wisdom be reconciled

(Maritain, Science, Philosophy and Faith, 29)

Philosophy is the discipline that is equipped with the requisite intellectual tools to carry out this much needed dialogue between the various fields of human knowledge. The Natural Sciences derive their foundational ideas and knowledge by means of experimental approaches. Theology derives its foundational ideas and knowledge from revelation. In this regard there appears to be a fundamental difference between the Natural Sciences and Theology. Within the context of the interaction that could exist between these different branches of knowledge there is need for the clarification of language and concepts. There is need also to specify logical coherency, because logic is still valid even in the denial of logic, and in order for one to effectively deny the validity of logic, one must at least be logically coherent. The denial of logic demands a use of logic; otherwise what one intends to communicate might be incomprehensibly lost in an incoherent Babel.

The goal should be seen in the openness and perennial dedication of the scholar to truth. It is within the liberative realm of truth that the various branches of knowledge can operate and flourish, and it is within the realm of truth that the various branches of

knowledge can communicate and co-operate. Philosophy as the love of wisdom must always be in the service of truth and it is in the service of truth too that the interaction between theology and science can effectively occur, and flourish. The service to truth will then build the bridges of authentic human freedom, collaboration and development. There is no gainsaying the fact that this service of truth too in the field of education is a much needed contribution with regard to human cultural development and formation.

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