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Dr. Schnabel's paper, "Philosophy, Christian Faith, and Lutheran Theology," discussed the relationship of faith and philosophy/science in the life of a Christian teacher who is a philosopher/scientist. This paper stimulated me to further thought regarding the relationship between philosophic and scientific methodologies. Striving to understand this relationship is essential for any teacher who wishes to more meaningfully address his/her discipline, whether in the sciences, liberal arts, or the humanities. The Christian teacher has the responsibility, in freedom under the Gospel and as a proper use of reason under the "Two Kingdoms" concept, to seriously address this question. One such attempt follows.

Fred Bartling 3/1/82

TOWARD AN UNDERSTANDING OF THE RELATIONSHIP OF PHILOSOPHIC AND SCIENTIFIC METHODOLOGIES

An intimate relationship exists between philosophy and science. Both endeavor to understand particular "facts" inherent in man's experiences. These "facts" are seen as the embodiment of more general principles. Philosophy and science both seek routine, the habitual in life and nature pointing toward generalizations abstracted from particulars.

Science, through careful empiricism, uses this abstractive process to suggest laws that classify the "things" and persistent "facts" of experience. The scientist strives through induction to classify and accurately analyse the relationships of classifications. Inductive generalizations lead to wider generalizations which point toward basic laws seemingly undergirding nature. Philosophy, however, operates by intuitively generalizing natural laws springing from the generalizations of science. The natural laws of philosophy are difficult to classify in the scientific sense because of their universal application. Philosophy is concerned about the relationships of the various empirical sciences and attempts to show these relationships through an intuited a priori knowledge. Philosophy solves its problems by dialectic and analysis of its concepts. Science, however, uses a careful empiricism to verify generalization through predictability.

To be noted, then, is a correspondence and cooperation between philosophy and science. Both are essential to one another even though their methods and aims differ. Philosophic intuitions, according to Alfred North Whitehead (See Chapter IX, "Science and Philosophy" in Adventures of Ideas) are the transition to philosophic method. Philosophy attempts to coordinate all of its intuitions regarding the relationships of the sciences into a systematic rationale of the world. This enterprise may seem to have little purpose for each particular science since a science does not usually analyse beyond its immediate context and classification. Science, however, must always remember that it is a specialization rooted in a philosophic weltanschauung peculiar to each epoch. A worldview is built up upon undefined assumptions, and science in each epoch is, therefore, an abstraction drawn from that worldview.

A philosophic system can never attain a full comprehension of reality. This suggests that philosophy and science both must be wary of the "dogmatic fallacy", or the blithe assumption that either has totally defined the complexity of the relationships within the real world. The coordination of philosophic notions into a metaphysical system is always partial and, as a result, every systematic topic of the special sciences, nurtured by metaphysical assumptions, is also partial. It is the task of philosophy to discover these limitations and reformulate its systems through new insights gained through this discovery.

Science must also realize that certainty is a delusion. Scientific observations are interpreted in terms of the philosophic conceptual order. Observation can never be an impartial dealing with true "fact". Science subjectively orders data according to assumptions drawn from the current worldview. Scientific method, when rigidly enforced, begins to produce discordance through its results and this points to the limitations of every philosophic and scientific understanding of reality. These limitations when discovered become the topics of philosophic reasoning which then attempt to propose an adjustment in the system's understanding of the world. Science, then, proceeds, within the framework of that adjustment. Whitehead's statement, in Adventure of Ideas on this relationship between philosophy and science is so acute that I quote him extensively:

> It is the task of philosophy to work at the concordance of ideas conceived as illustrated in the concrete facts of the real world. It seeks those generalities which characterize the complete reality of fact and apart from which any fact must sink into abstraction. But science makes the abstraction, and is content to understand the complete fact in respect to only some of its essential aspects. Science and philosophy criticize one another and provide imaginative material for each other. A philosophic system should present an elucidation of concrete fact from which the sciences abstract. Also the sciences should find their principles in the concrete facts which a philosophic system presents. (187)

Study of the history of scientific thought is an ideal approach for greater understanding of the relationship of philosophy and science. The Structure of Scientific Revolutions by Thomas S. Kuhn is an analysis of the shifts in the conceptual framework of scientists. Kuhn shows that science presupposes a conceptual, or paradigmatic framework that is accepted by the scientific community. Scientific practice eventually produces tension that cannot be resolved until the framework is adjusted by a new conceptual (philosophical) structure which enables science to look for new facts with more refined theory. Paradigmatic shifts evolve from epoch to epoch and are the joint product of philosophy and science. Whitehead illustrated this same point in Adventure of Ideas by showing that Aristoltelean and Newtonian physics each in their turn maintained their vitality only so long as they seemed relevant to current scientific practice and findings.

Whitehead's discussion of the importance of Plato's contribution to the basic philosophic notions connecting philosophy and science is a most lucid presentation of that topic. Plato's metaphysic, modestly and wisely called

"a likely story", attempted to express in concepts analagous elements in the composition of nature. So fruitful have been his categories of abstraction and the key ideas of harmony, mathematical relationships, and the interconnection of things, that modern physics approaches Plato's metaphysic in a startling manner.

The fact that philosophy and science have had a fruitful relationship in Western history, in spite of grave difficulties, is clearly illustrated by the division of labor in philosophic study today. Previously many scientists were wary of philosophy as mere obscurantism. Today most of the special sciences have their own philosophies for the clarification of ideas relevant to their discipline. Scientific classification has been so successful that many of the special sciences of today were formerly treated under the more general rubric of philosophy. The special sciences too often forget that they are the children of philosophy and philosophic method.

Common to all of the sciences is the need for philosophic study. Epistemology -- the relation of experience, belief, and language, and the dialectical clarification of concepts; metaphysics -- the task of clarifying every general notion and the, admittedly, sticky task of building systems that interrelate the sciences; and finally, ethics -- the theoretical study of moral judgment, are needed by all the sciences.

Logical positivism's criticism of philosophic method is, to a point, well taken. Surely suprasensitive realities and their existence cannot be proven scientifically. It also follows that dialectical analysis clarifying a concept does not necessarily prove the concept true. The logical positivist, is justified in being skeptical when metaphysics present supposedly a priori truths without attempting to have them established empirically. Science, on the other hand, cannot afford to divorce itself from philosophic intuition since this would easily lead to the "dogmatic fallacy" - imagining that science can without the aid of philosophic notions define totally the relationships that exist within the real world. Science needs the aid of a philosophy that modestly and undogmatically strives for a synoptic view and a conceptual framework within which science can work.

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FROM THE ACADEMIC POLICIES COMMITTEE

....The Academic Policies Committee recommends that the faculty approve the licensure programs, as appended to the Bulletin, in the following areas: Social Studies, Art, and Music.

H. Wentzel, Chairman