

PHILOSOPHY AND SCIENCE: UNDERSTANDING THE PLACE OF PHILOSOPHY IN A SCIENTIFIC AGE

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Abstract

Is there a link between Philosophy and Science? A simple question it seems. But the disparity in the answers shows it is not that simple. There are two parties to the case. One group holds that Philosophy and Science are mutually exclusive. They include the positivists who maintain that Science is a sufficient explanation of reality and that it alone covers the whole rational field, and the rationalists like Descartes who contend that only the human reason has the ability to give us true knowledge of reality –for this later group, only Philosophical a prior reasoning can open the door to the knowledge of reality. However, some thinkers have expressed the view that to see the two disciplines as entirely unconnected is to stretch their distinction too far. Philosophy and Science, they argue, are two complimentary fields of learning despite their individual autonomy. It is this afore-mentioned thesis that the paper undertakes to deepen by showing in clear terms how both disciplines complement each other in their common quest for truth.

Keywords: Philosophy, Science, Importance, Scientific Age, Complementarity.

Background of the Study

The modern age is commonly called the age of science because we take support of science and technology to-do almost every activity in the field of education, health and medical, communication, shopping, etc. Science has undoubtedly become an indispensable part of life. Science has rendered its valuable service to mankind in various spheres. Science helps in our work and makes it possible for us to eat, sleep and have comfort and relief. Civilised life means life in the lap of science. The most valuable service rendered by science to mankind is the control over environment. The inventions of agricultural machines and chemical fertilizers have increased in production. Science has extracted minerals and oils of great value from the bowels of earth. Thus machines have relieved man of heavy burdensome task and also provided ample leisure which he can use in cultural activities. It is now possible to rush help to any part of the world in case flood, earthquake etc. It has reduced the world to the size of a small family. Printing press has expelled ignorance and promoted enlightenment.

Medical sciences have made miraculous inventions for protecting man from fatal diseases. Till only a few years back diseases like leprosy, cancer, tuberculosis and polio were incurable. People suffering from these diseases, would strike horror and pity on the one hand and despair on the other. But today X-rays, anti-biotic drugs and surgical operations have

controlled disease to a great extent. Science has given eyes to the blind, ears to the deaf, legs to the crippled. Plastic surgery can even change a monster into a fairy. It has improved the standard of health and increased the longevity of human life. Scientific breeding has yielded satisfactory results in the case of animals, plants and even man. Science has even produced test tube babies.

Science has provided man with the means of comforts. The gift of electricity has placed unlimited power into the hands of mankind. We need no longer sweat in heat nor shiver from cold. Electric gadgets can finish entire cooking in half an hour. Washing, drying and pressing can be mechanically done. One of the miracles of science is the discovery of atomic energy. It has created a paradise on earth. It can create artificial weather for crops and it can also make barren land fertile. Atom bomb, hydrogen-bomb, missiles and other destructive war armaments are the valuable gifts of science. Man has succeeded to reach the moon and mars and explored their mysterious regions. Man is trying to reach other planets in the near future. Dams have been raised to check floods. No doubt science has provided knowledge and power and affected lives at several points. Huge labour and time saving machines have created the means of large-scale unemployment. Science has also created boredom from which relief is finding only in sex, drink and drugs. Better living standards have caused competition. Man has gained the world but lost his soul. It is the duty of statesman, humanists, social reformers and religious teachers to give a sense of purpose to mankind. It is true that evil lies, not in science, if badly applied. The remedy itself lies in science if well applied.

Over the last few hundred years there's been an exponential growth in scientific discoveries that explain the world we live in, and which have been developed into myriad technologies to improve human life (while also creating new problems, of course).

We are truly out of the dark ages and the basic humanity of a few hundred years ago and we are now in the age of light, where people can be cured of many ailments and you don't even have to get up from your lazy buttocks to get food, you can just shout at a machine to do it. Science has been our "candle in the dark" of our Demon Haunted World, explaining more and more of that which we previously limped on the crutch of religion to explain away. Almost each and every activity of human beings is being done with the support of science and technology. Without science and technology, nobody can imagine for luxurious life in this world. Due to these reasons, modern world is called age of science and technology.

Having weighed the merits and demerits of science, this work will address pivotal questions: has science supplanted philosophy in the modern era, and does philosophy retain its significance in an age where science has become omnipresent? We live in an unprecedented era in human history, where technology and science are widely accepted without ridicule from religious figures. Each era is defined by its distinguishing phenomena; hence, it is fitting to refer to our era as the Age of Science and Technology, given their profound impact. While acknowledging that technology and science have existed in the past, their influence on daily life and various aspects of modern society is unparalleled. To make progress, we must first clarify the meanings of the key terms "philosophy" and "science".

Science

The word science comes from the Latin Word “Scientia”, which means “Knowledge”. Etymologically, the word designates man’s knowledge of the world of nature. In this unqualified sense, “Science” is a very-easy-going term marriageable to anything that passes as knowledge. This usage equally makes the scientific knowledge a common possession of every person. But science is not just any type of knowledge. We do not call every individual a scientist. We call people scientists only when we feel they are in possession of some alleged “final truth”. Scientific knowledge is tested knowledge, and therefore it is certain. It is essentially explanatory and methodical. According to Ernest Nagel, the goal of the scientific enterprise has always been “to provide systematic and responsibly supported explanations” (Nagel, 1961). It is a systematic enterprise that builds and organizes knowledge in the form of testable explanations and predictions about the universe. According to Cambridge English Dictionary; science is knowledge from the careful study of the structure and behaviour of the physical world, especially by watching, measuring, and doing experiments, and the development of theories to describe the result of these activities.

For philosophers, for anything to qualify as Science, it must have the following characteristics: Certainty, necessity, universality and systematization. Accordingly, philosophers define Science as: “The certain intellectual knowledge of something in its causes; universal, demonstrated, organized knowledge of facts and truths and the reasons or causes of these.” Science then means certain knowledge of causes. It can be universal or special in scope. Science is universal when it has as its formal object everything that is, and as we are going to see the only universal science is Philosophy. Special Science considers only specific aspects of reality. In this paper, the term Science should be understood in its exclusive sense. If you like, we are discussing the relationship between Philosophy as a universal Science and the special Sciences such as Physics, Chemistry and Biology.

Philosophy

It is not possible to formulate a precise definition of philosophy; for according to Robert C. Solomon, the nature of Philosophy is itself among the bitterest disputes in Philosophy as every Philosopher has his own picture of what Philosophy should be and would want it to fit into that picture (Solomon, 1977). Nevertheless, there are still some basic elements common to the individual ideas of various philosophers which can give us a fair idea of what philosophy stands for. In *The Republic* of Plato, we read: “Only the man who has a taste for every sort of knowledge and throws himself into acquiring it with an insatiable curiosity will deserve to be called a Philosopher (Plato, 1941). That means in effect that the knowledge that is Philosophy is all-embracing. Philosophy knows all things in their being. For Maritain, Philosophy is “The Science which by the natural light of reason studies the first causes or highest principles of all things”. Philosophy thus is a Science- a universal Science- that groups the whole universe in a few members of principles and enriches the intellect without burdening it (Gonzalez, n.d). In short, Philosophy is a subject which, according to William James, deals with the principles of explanation that underlie all things without exception, the elements common to the gods and men and animals and stones, the first whence and the last whither of the whole cosmic procession, the conditions of all knowing and the most general rules of human conduct.

Philosophy and Science as Partners

In what ways then do Philosophy and science compare? First, Philosophy is wisdom because it studies things in their principles and causes as pointed out. Philosophy deals with ultimate causes- the highest attainable by human mind. Science on the other hand deals with 'Proximate' or 'near' causes (Maritian, 1959).

Again, while Science commits itself to particulars, Philosophy considers the universals. 'As a universal Science' writes Matthew Nwoke, 'Philosophy transcends all forms of parochialism in its enquiries, conclusions and principles. Its objects are universal objects'.

It follows then that Philosophy and Science vary with respect to the degree of completeness with which they achieve their explanatory systems. Even though both provide explanations since both ask and answer the question 'why', philosophical explanation is more expansive and comprehensive than the scientific explanation. This is the point very tellingly made by Chukwudum B. Okolo in the following lines:

The great limitation of the Scientist is his failure to ask the 'Ontological why'...for he is committed not to the why of things in their ultimate causes but only to their how, their explanations and descriptions. Philosophy, on the other hand, advances the insights and discoveries of Science and completes its task, so to speak (Okolo, C.B., 1989).

The distinction between Science and Philosophy can also be seen in terms of their methodologies. As B Modin observes, the scientific procedures is horizontal-it proceeds from Phenomena to Phenomena. The method of Philosophy on the other hand is transcendental and vertical-Philosophy brings reason to bear on the facts of experience and from there moves onto their causes (Mondin, 1985).

Further, whereas Philosophical questions are theoretical and therefore cannot be subjected to empirical verification, scientific questions are phenomena-bound, and require just empirical answers. Put in other terms, the Scientific method is just a matter of a "look and see" unlike the Philosophical method which is that of speculation(Gonzalez, n.d). Moreover, Philosophy is different from science in the sense that it criticizes all subjects, including knowledge itself. To Science, it functions as an epistemological gadfly, checking its excesses by way of critique and controversy. Granted Science uses knowledge; even so, it does not make knowledge a subject of investigation and does not question its validity. On the distinction between philosophy and Science, Bertrand Russell Writes: "The essential characteristic of Philosophy which makes it a study distinct from Science is criticism" (Russel, 1967).

On the distinctions between Philosophy and Science, the following quotation from Battista Mondin's Philosophical *Anthropology* is very instructive:

Philosophical knowledge is not cumulative and it is not susceptible to progress as Scientific knowledge is; it is not something that can automatically be handed down from generation to generation as is done for the mathematical and experimental Sciences.....more than Sciences, Philosophy is wisdom; it is more the fruit of meditation than of study...(Mondin, 1985).

Every Science is an autonomous entity with full faculty to judge and correct its own mistakes where necessary. Yet, as Maritain observed: “It is obvious that a superior Science has also the right to judge and correct, if the mistake should contradict one of its own results and this come under its jurisdiction” (Maritain, 1959). Such is the case between Philosophy and Science. Philosophy as the supreme Science is superior to Science. And because it is wisdom, it is competent to determine by the light of its principles the extent to which a scientific hypothesis has contradicted a truth established by Philosophy. The same is true even when it is the conclusion of Philosophy that seems to contradict a scientific truth. Science derives its postulates from the natural evidence of the intellect and experience. As such, it is incapable of determining the question by its own principles and data.

Furthermore, Philosophy deals with questions which involve the principles on which the certainty of the conclusions of Science in the last resort depends-Philosophic principles are the absolute first principles which are the conditions of all knowing. Scientific principles, one may argue, can be known without an explicit knowledge of Philosophical principles. Yet, the fact remains that ‘they could not be true, unless the latter were true’ (Ibid., p.85).

Thus, scientific truths actually presuppose philosophic truths. Hence, it is said that Philosophy governs the sciences (Ibid., p.84). Again, it belongs to philosophy to defend scientific principles against possible objections. The author summarizes the relation of Philosophy to Science this way: Philosophy... the supreme Science, judges, governs, and defends the other Sciences. Science cannot defend itself in the face of objection. Its demonstrations are built on postulates, which it can neither explain nor defend. In fact, considering that the notions of efficient causation and logical necessity are not explicable by an appeal to the world of physical phenomena, it can be said that scientific principles are assumptions. Hence the conclusion of Maritain that it belongs to Philosophy to defend Science against every possible objection (Ibid., p.88).

Worthy of note also is that Philosophy depends on Science in a certain sense. Philosophy borrows the propositions of Science and uses them to illustrate its own principles. In other words, Philosophy depends materially and instrumentally on Science by employing scientific truths and conclusions to corroborate its own principles. But we must know that Philosophy need not use scientific affirmations as basis for its own truths; for philosophic truths are self-evident and its premises, self supported (Ibid., p.88).

It can be seen that despite the well-marked features that separate Philosophy and Science, both disciplines are not mutually exclusive and do not function in isolation. A certain symbiotic relationship still exists between them. Philosophy uses the postulates of Science as confirmatory evidence of its own principles and Science, on its own part, cannot do without Philosophy, which is in fact, its foundation and justification.

Relevance of Philosophy in this Age of Science

Has science displaced philosophy in this modern age? Is philosophy still important in an era where science has become ubiquitous? The existence and importance of philosophy are debatable matters, as its relevance appears to be diminishing in the face of rapid scientific progress and discovery. Despite the historical affinity between science and philosophy, many

present-day scientists perceive philosophy as distinct from, and even antagonistic to, science. Nevertheless, philosophy remains an essential component of scientific progress.

Philosophy clarifies complex scientific concepts and theories, influencing fields such as modern physics through debates surrounding space and time. Philosophical discussions about mathematical foundations have also shaped our understanding of mathematical truth and empirical reality.

Philosophy critically assesses scientific assumptions and methods, examining underlying metaphysical and epistemological commitments to identify potential biases and flaws. Philosophical examinations of objectivity have led to a deeper understanding of the relationships between observation, measurement, and scientific knowledge (Kuhn, 1962).

Philosophy facilitates the formulation of novel scientific concepts and theories. René Descartes' philosophical ideas, for example, laid the groundwork for modern mechanics and mind-body dualism. Philosophical debates about causality have also influenced modern theories of causation in physics and other sciences.

Furthermore, philosophy fosters dialogue between scientific disciplines and between science and society. By examining the broader implications of scientific discoveries, philosophers assist scientists and policymakers in navigating complex ethical and social issues surrounding emerging technologies.

In conclusion, philosophy remains vital to scientific progress, contributing to concept clarification, critical assessment, theory formulation, and interdisciplinary dialogue. As science evolves, philosophy's importance in shaping and guiding scientific inquiry will continue to grow.

The Clarification of Scientific Concepts: First, philosophy offers conceptual clarification. Conceptual clarifications not only improve the precision and utility of scientific terms but also lead to novel experimental investigations because the choice of a given conceptual framework strongly constrains how experiments are conceived. In the life sciences, philosophical reflection has played an important role in issues as diverse as evolutionary altruism, debate over units of selection (Sober & Wilson, 1998), the construction of a “tree of life” (Koonin, 2011), the predominance of microbes in the bio-sphere, the definition of the gene, and the critical examination of the concept of innateness (Mameli & Bateson, 2006). Likewise, in physics, fundamental questions such as the definition of time have been enriched by the work of philosophers. For example, the analysis of temporal irreversibility by Huw Price (1996) and closed temporal curves have helped dispel conceptual confusion in physics (Rovelli, 2018, Lewis, 1976).

Philosophy has also helped the field of cognitive science winnow problematic or outdated assumptions, helping drive scientific change. The concepts of mind, intelligence, consciousness, and emotion are used ubiquitously across different fields with often little agreement on their meaning (Lewis, 1976). Engineering artificial intelligence, constructing psychological theories of mental state variables, and using neuroscience tools to investigate

consciousness and emotion require the conceptual tools for self-critique and cross-disciplinary dialogue, precisely the tools that philosophy can supply.

A Critical Assessment of Scientific Assumptions: Philosophy aids in authenticating scientific findings through unbiased critique. The scientific revolution, which gave rise to novel methods of inquiry, emanated from the critical analysis of Ptolemy's works by Copernicus. The long-standing ancient theory of geocentrism was supplanted by heliocentrism. Through the Epoche of the Baconian idols, scientific enterprise garnered objective proof of its claims. Philosophy sets a maxim to which science can aspire in its moral operatives. Were the universe to be left entirely to science, it would lead to an immediate collapse of the entire system, considering the rapid growth of scientific discoveries. Philosophy provides the fundamental basis for all inquiry, which Aristotle referred to as the four causes (material cause: "that out of which" it is made; efficient cause: the source of the object's principle of change or stability; formal cause: the essence of the object; final cause: the end or goal of the object, or what the object is good for).

Questioning the Ethical Justifications of the Scientific Findings: Presently, philosophy still plays a vital role in the human condition and enterprise. This is because it provides a comprehensive interpretation of fundamental issues and the events pertinent to them. It probes into the various forms of meaningful language, the nuances and differentiations in human communication, as well as the analysis and synthesis thereof. Hence, it attempts to ensure clarity and understanding in human dialogue and assumptions. It seeks to satisfy humanity's curiosity regarding life, existence, the beginning and end of things. It acts, to some degree, as the "guide of life", since it guides the individual in acquiring a concrete outlook on life, the values and meaning of life, its proximate and ultimate ends, and seeks to establish for the individual a scale of values for human conduct (Russell, 1978). The question of moral justification and the effects of scientific discoveries on human beings and other habitats falls within the domain of philosophy.

Evaluation and Conclusion

This paper has sought to justify the vital role of philosophy in our contemporary scientific age. While our exploration is not exhaustive, we emphasize that philosophy's value cannot be overstated. Philosophy develops the human mind to reason correctly and rationally, enabling humans to overcome the idols enunciated by Francis Bacon in their application of scientific methods. Science, as a human enterprise, needs philosophy; it is a basic human need.

A philosophy-free science would be detrimental. Without philosophical underpinnings, modern science would face significant challenges: the deluge of data would make interpretation increasingly difficult; the neglect of historical context would further fragment scientific sub-disciplines; and the emphasis on empirical results would lead to superficial training of students. As Carl Woese aptly noted, "a society that permits biology to become an engineering discipline, that allows science to slip into the role of changing the living world without trying to understand it, is a danger to itself" (Woese, 2004).

We recommend that scientists receive at least basic philosophical training, as science relies on hypothesis and verifiability principles that require critical thinking. Maintaining strong ties with philosophy will enhance the vitality of science. A reinvigoration of science, grounded in

philosophical principles, is necessary to reap the full benefits of scientific inquiry. Ultimately, humanity requires both philosophy and science to achieve a comprehensive understanding of reality.

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