

T. U. NWALA ON THE RELATION BETWEEN SCIENCE AND NON-SCIENCE

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Abstract

The debate on the relation between Science and Non-science is an age long one. Since the departmentalization and branching off of Science from Philosophy, such debate has always ranged on especially between philosophers and scientists. Such issues bother on the meaning, characteristics and methodology of Science and Non-science. Arising from this debate is the dichotomy between scientific method, scientific culture, scientific knowledge and non-scientific method, culture and knowledge. While some scholars are of the opinion that Science is radically opposed to Non-science, others are of the view that the difference is only a matter of progress from a lower to a higher epistemic level. It is only a matter of change in degree of sophistication of method. For T.U Nwala, the difference is a movement from Non-science to Science which, borrowing from Hegel's terminology, is one of "Sublation"; a movement in which something remains the same while something is lost and something new is gained. This relation he qualifies as "The Theory of Radical Interpenetration;"¹. This paper critically analyses Nwala's theory, and concludes that Science and Non-science should not only interpenetrate, but should complement each other in what I term "The Principle of All Inclusive Complementarities". Humanity would be better if these two dimensions of reality should be allowed to complement each other.

Keywords: Science, Non-Science, Radical Interpenetration, Inclusive Complementarities, Sublation.

Introduction

Any meaningful discussion on the relation between Science and Non- Science should take into consideration the meaning and characteristics of both Science and Non-science. Also to be taken cognisance of is the boundary line between Science and Non-science. Such questions that usually arise in this type of demarcation is whether in theory and in practice such boundary line exists or if it is a matter of intellectual dispute.

¹ T. U. Nwala *History and Philosophy of Science*. (Nsukka; Niger Books, 1997), 90.

The debate on the relation between Science and Non-science is an age long one. Since the departmentalization and branching off of Science from Philosophy, such debate has always ranged on especially between Philosophers and Scientists. Such issues bother on the meaning, characteristics and methodology of Science and Non-Science. Arising from this debate is the dichotomy between scientific method, scientific culture, scientific knowledge and non-scientific method, culture and knowledge. While some scholars are of the opinion that Science is radically opposed to Non-science, others are of the view that the difference is a matter of progress from a lower level to a higher level. It is only a matter of change in degree of sophistication of method. The difference is a movement from “Non-science” to “science” which can be described as one of sublation; a movement in which something remains the same while something is lost and something new is gained. This is the position of T.U. Nwala on the relation between Science and Non-science. This relation he qualifies as” The Theory of Radical Interpenetration”.² A critical analysis of this theory will be done later in this work as this is the main thrust of this exercise. Before this analysis, let us briefly examine the meaning and characteristics of Science and Non-Science and also x-ray the main tenets of a scientific and non-scientific culture. We will also probe further to know if there are any relations between the two.

What is Science?

According to Schifferes “no single definition of science has ever been accepted”,³ hence he preferred description to definition of science. However, an attempt would be made to define and describe science.

Science is defined as “knowledge of facts, phenomena, laws, and proximate causes, gained and verified by exact observation, organized experiment, and correct thinking; also, the sum of universal knoweldge”.⁴ It is any department of knowledge in which the results of investigation have been systematized in the form of hypotheses and general laws subject to verification.⁵ The earliest definition of Science before specialization of different fields of study is that science is any organized system / body of

² Nwala, *History and Philosophy of Science*, 90.

³ J. J. Schifferes, *The Autobiography of Science*, America, Free Press, 1960, vii.

⁴ *The New International Webster's Comprehensive Dictionary of English Language*, Florida, Trident Press International, 2004, 1127.

⁵ Nwala, *History and Philosophy of Science*, 8-9.

inquiry. However, as of today, there are many organized systems of inquiry that cannot qualify as science in the strict sense.

Science is concerned with an objective, rational and systematic body of knowledge. It is critical and rely on reason. Science is also empirical and experimental and relies on the principle that the universe is governed by material laws which may be mechanical, electrical, chemical, biological etc.⁶ These characteristics of Science is what is today referred to as scientific culture. A culture is said to be scientific if it embodies certain basic scientific principles. These include the principle that the universe is governed by laws. That the universe is rational and systematic, and therefore events within it can be rationally explained, predicted and controlled. That every object and every phenomenon can be observed with the aid of instruments. That the universe and all reality contain various parts, which can be separately studied and analysed. That the universe as well as events taking place within it are quantifiable. That man is capable of understanding the truth, the essence and laws governing the universe. This makes scientific discoveries possible. There is also universal law of change or motion. Man is capable of changing the world through technology and that human thought, ideas and principles can be operationalised.⁷ Some scholars are of the view that these features separate Science from Non-science..

What is Non-Science?

The perception of some scholars is that Non-science is the opposite of Science. This is because all the features enunciated above are lacking in Non-science especially in Religion and Theology. For these scholars, Non-science lacks rational, critical, systematic, logical, empirical, predictive, experimental and open approaches. Non-science is dogmatic and speculative relying heavily on faith and spiritual laws. It ignores the material and empirical approaches of Science in its quest for knowledge acquisition.

However, a discipline like philosophy shares a lot in common with Science. Philosophy like Science is rational, critical, systematic, logical and rigorous in its search for knowledge. In short, these characteristics are at the core of any philosophical method. These areas of convergence have raised a

⁶ Nwala, *History and Philosophy of Science*, 8-9

⁷ Nwala, *History and Philosophy of Science*, 6.

lot of controversies on whether there is actually a clear-cut distinction and demarcating boundaries between science and non-science (Philosophy).⁸

Distinction is often made between Science and Non-science. Among those things called Non-science are common – sense, Art, Imagination, Myth, Religion, Mysticism, Metaphysics etc. It is said that these things described as Non-science are “subjective, unverifiable, non-factual, not objective, not systematic and not quantifiable”.⁹ Consequently, knowledge based on them does not enable us to explain, predict and control phenomena in the way scientific knowledge can. It is often a matter of guess work, involving trial and error, when we rely on ordinary common-sense, art, imagination etc.¹⁰ Arguing further, Nwala observed that it is generally agreed that common-sense furnishes Science with some data with which it builds up scientific knowledge. Science according to some scholars differs from Non-Science only in degree. This position raises some controversies. Does Science really differ from Non-science only in term of degree? Are we postulating that Science is Non-science and vice versa? Does the method of science apply to Non-Science? Is this convergence mechanical, physical or dialectical? Is there any clear-cut limitation of this relation of degree if it exists? These mind-boggling questions were tackled by different philosophers and scholars whose views we are going to explore.

The Relation Between Science and Non-Science

Many scholars are of the view that there exist relations between Science and Non-science. Leibniz in his *Philosophical Writing* noted that principles of science are dogmatic and historical.¹¹ For him, Science also includes Ontology, or the science of something and nothing, being and not being, the things and its mode, and substance and accident. The departmentalization of the science does not matter because all the sciences are continuous body like the ocean. Furthering his argument, Leibniz observed that in the world of science, there is a certain unity which is dominant. That which is dominant is the monad. According to him, there is nothing real in the world save the monads and their representations which are ideas and perceptions. Monad for

⁸ A.C Areji, “Understanding Human Development via Hegelian Sublation: Focus on Religion, Philosophy and Science” in *Philosophy, Science and Human Development* (C.N. Ogbozo and C.I Asogwa ed) Enugu, Snaap Press Ltd, 2014, 305.

⁹ Nwala, *History and Philosophy of Science*, 4.

¹⁰ Nwala, *History and Philosophy of Science*, 4.

¹¹ W. Leibniz *Philosophy Writings*, London, J.M. Dent and Sons Ltd, 1973, 5.

Leibniz is the foundation of Science and Non-science because reality is constituted only by monads.¹²

In the *Logic of Scientific Discovery*, Karl Popper commented that everything in science is provincial and subject to correction and replacement:

We must not look upon science as a “body of knowledge”, but rather as a system of hypotheses which in principle cannot be justified, but with which we work as long as they stand up to tests, and of which we are never justified in saying that we know they are ‘true’ or ‘more or less certain or even probable.’¹³

Popper questions the claims of infallibility, indubitability and certainty of science. For him, every claim of Science should be subjected to integrity test of scientific claims. This also applies to Non-Science.

For Popper, “Scientists may draw upon diverse sources of inspirations, such as metaphysical beliefs, dreams, religious teachings and so on, when trying to formulate a theory”.¹⁴ The implication is that certain concepts and activities which are accepted as Non-science constitute a veritable tool and rich raw materials for the scientists in their scientific enquiries. These practices and activities most often graduate from Non-Science to Science. In agreement with Popper, Lahatos as cited in Ladyman wrote that for Popper, “Virtue lies not in caution in avoiding errors but in ruthlessness in eliminating them”.¹⁵

Alfred North Whitehead was of the view that science cannot progress without metaphysics.¹⁶ For him, the basic features of physical science is that it ignores all judgments of value like aesthetic or moral judgment. Scientists think that physical science is purely matter of fact. He maintained that the sphere of thought left for physical science should include ontology which is “the determination of what truly exists; in other words metaphysics”.¹⁷ He described it as a pity the non-inclusion of metaphysics in scientific enquiry. Such an enquiry is a necessary critique of the worth of science. Science is separated from metaphysics simply because of practical reasons; namely because we can agree about science after due debate, whereas in respect to metaphysics, debate has wither to accentuated disagreement.¹⁸

¹² Leibniz *Philosophy Writings*, 6.

¹³ K. Popper, *Logic of Scientific Discovery*, London, Routledge Classics, 2002, 318.

¹⁴ Popper, *Logic of Scientific Discovery*, 318.

¹⁵ R Ladyman *Understanding Philosophy of science*, New York, Routledge, 2002, 72.

¹⁶ A.N. Whitehead, *The Aims of Education*, England, Williams and Norgate Ltd, 1961, 117.

¹⁷ Whitehead, *The Aims of Education*, 117.

¹⁸ Whitehead 117.

In what he termed “The Metaphysical Foundations of Science”, Ogbozo noted that the history of both science and philosophy is replete with scientists and philosophers of nature who inquired into the nature of our physical universe and located its constitution in one basic element or another.¹⁹ The doctrines about atoms and numbers and the scientist’s basic elements and the metaphysician’s principle of simplicity are evidences detailing the close affinity between science and Non-Science. He averred;

Now, the scientist’s search for the most fundamental element is tantamount to the inquiry into the origin of a thing. The question of origin or a beginning is properly a metaphysical issue because it gives the *fundamentum* without which the existent can never be. In other words, an origin is interchangeable with a *Subtractum*, what lies under any existent being, its source of generation and motion. Therefore, the problem of origin is tied up with the question of existence, and nothing can be very metaphysical as the question of existence.²⁰

Apart from the issues of origin and doctrines about atoms and numbers, Ogbozo recognized other relations such as scientific demonstration and metaphysical principle of causality; and scientific laws and metaphysical presuppositions.

Reuben Abel reminded us that both Science and Non-science (Philosophy) play complimentary role in their respective inquiries. For him, “it is presumptuous for the philosopher to disparage the procedures of the scientist, and it is stultifying for the scientist to ignore the logical analysis of his concept and supposition”.²¹ Philosophy (Non-science) and Science as we have seen, are certainly integrative in the overall purpose, namely, to uncover for man as much knowledge of the world and of man as is humanly possible. Both direct their inquiries to satisfying man whose curiosity extends to the infinite, to finding out the truth and knowledge of the universe and what it entails for man such that “if in the long run they do not complement each other, the human enterprise will suffer”.²²

¹⁹ C.N. Ogbozo. “Science and Philosophy in Interactive Growth; A Challenge to African Scientists and African Philosophers”, in *Philosophy, Science and Human Development*, 262.

²⁰ Ogbozo, “Science and Philosophy” ..., 267-268.

²¹ R. Abel, *Man is the Measure; A Cordial Invitation to the Central Problems of Philosophy*, New York, The Free Press, 1976, xiii.

²² Abel, *Man is the Measure...*, xiii.

For Titus, Smith and Nolan, Science supplies philosophy (Non-science) with a large amount of factual and descriptive materials essential in the building of a philosophy. Indeed, the philosophy of any period tends to reflect the scientific outlook of that period. Science exerts a check upon philosophy by helping to eliminate such ideas as are incompatible with scientific knowledge. On the other hand, philosophy takes the piecemeal knowledge of the various sciences and organizes it into a more complete and integrated world-view.²³ In this connection, the very progress of the sciences makes philosophy necessary since the discovery of new facts and relationships forces us to revise our notions and interpretation not only in the sciences but in most other fields.

Eboh observed that historically in the old days, thinking was mainly cosmological and no distinction was made between science and other disciplines such as metaphysics (Philosophy): hence Plato and Aristotle held philosophy as science per excellesice.²⁴ In the Ionian period, non-science such as philosophy and myth were integral to the search for knowledge of the universe. Most of the Ionian philosophers were regarded as natural scientists. Their predictions and postulations were more mythical than scientific. Such postulations regarding the original stuff by Thales, Anaximander, Anaximenes and others were not based on any scientific method. Many of these postulations laid the foundation of what we celebrate today as inventions and land-breaking innovations in modern science.

Similarly, the fact that non-science especially philosophy shares a lot in common with science is a testament that both have a common origin. Science and philosophy make use of rational inquiry and employ critical reason in their task although they do so differently but in a related manner. In science, the emphasis is more on a description of laws of phenomena and on causal relationships. Philosophy is interested in the relation between particular facts and larger scheme of things, science employs observation, experimentation and classification of the data of sense experience. Philosophy, because of the nature of its problems seeks to relate the finding of the science to the claims of religion, ethics, and the arts.²⁵ It was in a bid to solve this

²³ K.C. Arua, "Philosophy and Science; Areas of Divergence and convergence" *Philosophy, Science and Human Development*, 126.

²⁴ B.O. Eboh, *Basic Issues in the Theory of Knowledge*, Nsukka, Falladu Publishing Co., 1995, 93.

²⁵ Arua, "Philosophy and Science", 126.

problem that Bertrand Russell proposed what he termed Scientific Philosophy. According to Russell in *The ABC of Relativity*;

A scientific philosophy such as I wish to recommend will be piecemeal and tentative like other sciences; and above all, it will be able to invent hypotheses which, even if they are not wholly true, will yet remain fruitful after the necessary corrections have been made. This possibility of successive approximations to the truth is more than anything else, the source of triumphs of science, and to transfer this possibility to philosophy is to ensure a progress in method whose importance it would be almost impossible to exaggerate.²⁶

This for Russell is to ensure progress and advancement in knowledge acquisition. Non-Science assumes refinement, clarity and advancement when refined by science.

Efforts have been made to elucidate the areas of convergence and divergence between Science and Non-Science by different authors. We now turn to T. U. Nwala to explore what he considers to be the relation between Science and Non-Science through his “The Theory of Radical Interpretation.”

The Theory of Radical Interpenetration

The relation between Science and Non-Science for Nwala can be aptly captured by what he termed “The Theory of Radical Interpenetration”. For him, “in contrast to the ‘either-or’ approach in the elucidation of the nature of Science and its relation to the Non-Science, I offer a dialectical approach in ‘the theory of radical interpenetration’”.²⁷ Furthering his argument, he asserts that “what we see in the relation between ‘science’ and ‘non-science’ is radical or progressive movement along the trajectory ‘non-science-science’ or from more ‘non-science’ to ‘less non-science’, which is at the same time a movement from ‘less-science’, to ‘more science’”.²⁸ This for him is the same trajectory followed by the course and history of the entire human knowledge.

For Nwala, the development of human knowledge has always been a journey and a movement from the lower stage to a higher stage. The relation between science and non-science is properly appreciated and better elucidated using this method or approach. According to him;

²⁶ B. Russell, *The ABC of Relativity*, London, Unwin Paperbacks, 1985, 46.

²⁷ Nwala, *History and Philosophy of Science*, 89.

²⁸ Nwala, *History and Philosophy of Science*, 89.

At the end of this journey we may find, using a Hegelian metaphor, a movement from “being in its elementary contradictory nature to ‘being in its fuller sense in which some of the contradictions in our earlier notion of being or reality have been resolved or shed-off. Thus science defines our knowledge of reality in which our earlier contradictory notions at the level of non-science is relatively purified and made more objective and more concrete. At a higher level in this progression, we have knowledge and forms of practice that are increasingly attaining a character or set of characteristics which we define as scientific.”²⁹

The relation between science and non-science thus can be seen as a projection, a movement and a journey.

In Nwala’s opinion, another way of expressing this theoretical model is simply to assert that this movement is from a state of knowledge (theoretical and social practice) which is predominantly non-scientific to one which is predominantly scientific. There are no existential conditions or cultural states that are purely scientific or non-scientific.³⁰ Every state of affairs is dynamic and transient.

In elucidating the core of “the theory of radical interpenetration”, Nwala asserted the following:

- a. That scientific ideas and forms of intellectual consciousness and non-scientific ones do co-exist and mutually influence each other. Scientific discourses and theories do influence our religious and mystical ideas and world-view.
- b. At the same time, religious and mystical theories do influence our scientific views and also do provide issues and hypothesis for scientific investigation.
- c. Both forms of ideas claim superiority over each other. Thus, there is historically a running battle between what may be called science and mysticism. Plato and Spinoza, for example, classified scientific knowledge lower in cognitive status than intuitive (somewhat mystical) apprehension of reality.

²⁹ Nwala *History and Philosophy of Sciences* 89-90.

³⁰ Nwala *History and Philosophy of Sciences* 90.

- d. The movement from “non-science” to “science” can be described as one of sublation which according to Hegel is a movement in which something remains the same while something is lost and something new is gained.
- e. The higher the movement towards scientific culture, the more possibility there is that scientific categories begin to manifest quasi-mystical or quasi-religious character.

Thus, in the history of both science and philosophy, the conception of reality has moved away from the debate on the primacy of either mind (spirit) or matter to the conception of neutral stuffs and further to one in which mind and matter share similar attributes as “field of energy” which is neither material nor spiritual, but yet more spiritual than material in the old sense. Thus matter has been reduced to a state similar to “vital energy” while spirit seems to be losing its old strict teleological and personalistic sense, and is now sheer dynamism,³¹

Nwala defended his position by citing Athur Eddington who defended the co-existence of science and non-science. In his book *The Nature of the Physical World*, Eddington maintained that the world of science cannot replace the world of common-sense or even the mystical world. Both knowledge are essential for men and complement each other.

The physicist, now regard his external world in a way I can only describe as more mystical, though not less exact and practical than that which prevailed since years ago when it was taken for granted that nothing could be true unless an engineer makes a model of it... certain assumptions, expectations, or fears are no longer applicable.³²

He averred that a role must be given to mind and consciousness since they make the beginning of scientific investigations possible. According to Eddington, with the final overthrow of strict causality by Heisenberg, Bohr, Born and others in the external, it leaves us with no clear distinction between “Natural and Supernatural”.³³

In Nwala’s view, a certain category formulated in a speculative, mystical religious or intuitive manner increasingly sheds its non-scientific character, acquires new meaning which may have scientific character, yet

³¹ Nwala, *History and Philosophy of Sciences* 91.

³² Nwala. *History and Philosophy of Sciences* 91.

³³ Nwala. *History and Philosophy of Sciences* 92.

some of the religious elements remain. This is the method of sublation. “Thus our concepts of reality, matter and spirit have undergone radical transformation in their meaning in intellectual history. The spiritual can now be likened to a field of energy, dynamic and active, and matter has been reduced to the same quality”³⁴

- f. Socially and historically, radical interpenetration of the realms of reality manifests itself in the evolution or development of certain universal ideas and values, cumulatively achieved over time.³⁵ According to Nwala, a value or an idea so historically born, acquires new meaning in its development, socially manifests itself in practice in different ways, which vary in content. Each level of this hierarchy can serve as a foundation for the success of the higher level.
- g. At the epistemological level, radical interpenetration also occurs. For Nwala, the intuitive grasp of reality is a fundamental attitude common to all levels of human cognitive attitude (scientists, and non-scientists). The level of intuitive penetration into the essence of reality does not necessarily conform to a linear evolutionary cause. It is rather more cyclic than linear.³⁶

For him, at the so-called “primitive” or lower level of knowledge”, a deeper level of intuitive grasp of reality than at the scientific level is possible for an individual. Certain intuitive sensibilities may be sharpened in the course of intellectual development, while others may be dulled or numbed. Arguing further, he noted that what is grasped intuitively may be concretely or objectively expressed or even mathematically quantified. Indeed, what modernity has achieved is a higher level of quantification or mathematicisation of that which is known. Traditional – or the so-called scientific mind is able, to grasp certain essential qualities of reality than is possible for the so called scientific mind. Such deeper meanings or principles so grasped may be later corroborated scientifically through research. This is very much applicable in the areas of traditional medicine, arts and fore sights. Oguakwa supported this position by asserting that “traditional medicine presents a model of health care which is completely responsive to man in his psycho-physical reality and unity.”³⁷

³⁴ Nwala. *History and Philosophy of Sciences* 92.

³⁵ Nwala. *History and Philosophy of Sciences* 93.

³⁶ Nwala. *History and Philosophy of Sciences* 93.

³⁷ Nwala, *History and Philosophy of Science* 93.

Radical interpenetration of life, knowledge, culture and nature appears as a regenerative cycle involving decay and rebirth according to Nwala. For him, we can also look at the radical interpenetration of science and non-science as they relate to the “existential regime” or cultural milieu to see how for example the rational method of scientific technique can enable us to explore traditional myths and uncover the kernel or truth which is confused in their form. This movement enables us to eliminate the irrational and non-scientific elements of culture. We can at the same time, apply the rich accumulated values of tradition to humanize the otherwise lifeless and amoral scientific technique. This was the spirit of the Renaissance and the longing for Humanism of the modern age.³⁸

Nwala concluded by asserting that Non-science is the foundation of science and essentially differs in matter of degree. “Mankind’s achievement came first in the attainment of fundamental human values before the great scientific and technological accomplishments.

Concluding Reflections

The debate on the relation between Science and Non-Science is an age long debate. It is also puzzling and seemingly endless. Much energy has been dissipated on this issue and much more will be dissipated. The position of this paper is that even though this debate is interesting and engaging, it is to some extent unwarranted. Human knowledge is a corpus and also organic and systematic. No one branch of human knowledge can serve humanity. Both Science and Non-Science are required by man to have a holistic grasp of himself and the universe. Dichotomisation of knowledge is not only detrimental but equally dangerous to human growth and progress. A scientific culture devoid of spirituality is not only monstrous but dangerous to humanity. Similarly, a Non-Scientific culture without a tint of science is highly retrogressive and damaging.

I opine that to fully tap from the abundant resources of Science and Non-Science an approach of “The Principle of all-inclusive Complementarities” should be adopted. Science should complement Non-Science and vice-versa. Humanity will be better if these two dimensions of reality should be allowed to complement each other. This approach will enhance authentic and an enduring human flourishing. It will equally save

³⁸ Nwala, *History and Philosophy of Science*, 94.

humanity from the ills associated with extremism. After all, what we celebrate today as science fiction is more of Non-science than science in the strict sense of modern science.

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