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CRITICAL INTERSECTIONS BETWEEN RELIGION AND SCIENCE IN TRADITIONAL AFRICAN WORLDVIEW

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Abstract
That religion and science are after one common objective which is to understand the external world is not in doubt. The difference however in the quest for this objective is the cultural method employed, the kind of question asked as well as the attitude towards the outcome of such an inquiry. Since science from the Latin root word "scientia" translate as "knowledge," it becomes compelling to ask if there is such thing as knowledge of the external world by African forebears? If there is, what does it look like and how is it different or similar from science that emanates from the Western culture and tradition? The paper highlights areas of intersections such as hypotheses and theory formulation, observation and experimentation as well as mathematical language as important features of science. The paper, adopting the method of critical analysis, engaged religion (belief in a Supernatural creator) and science (knowledge of matter) from the angle of their focus on the understanding of the laws found in nature. The novelty of the paper is in the interrogation of the scientific attitude as it is known today in western culture and the quest to see if this is present in traditional African worldview and practice.
Keywords: Religion, science, Africa, Knowledge, world, principles, hypotheses, theories, sophistication.

Introduction

Where it is understood clearly that religion and science are not antithetical to each other because of their quest to understand the world, the tension that arises when the two disciples are mentioned will be greatly doused as well as the unnecessary hostility. Setting this point in perspective, Kurtz avers:

> Is science compatible with religion, or must they of necessity conflict? Their relationship has long been debated and pitched battles of varying degrees of intensity have been waged throughout history between the partisans of those two areas of human interest. Although science had its

> precursors in ancient Greece and Rome, the dawn of modern science began in the sixteenth and seventeenth centuries when scientists and philosophers developed a new method of inquiry. These pioneers abandoned tradition, mysticism, revelation and faith, and proceeded directly to the Book of Nature (11)

The supposed Book of Nature cannot be read and understood if one is not given to thinking or there are no men given to critical thinking. Traditional Africa is actually replete with great sages who made sense of their environment by understanding the laws by which things work and who with that knowledge were able to lead fulfilling lives. Such men of profound wisdom, knowledge and understanding are not only found in Rome or Greece. Laying credence to this, Archibong and Usoro assert that "man has always been on a quest to understand his existence and the universe in which he finds himself. He is fascinated as Kant opines by the starry stars above and the moral law within. Man stands as a tiny jot before the vast expanse of the sky filled with wonders at how these came about" (221).

Clearly then, religion and science affirm the existence of the material and immaterial dimension of reality of which humans try to make sense of, and of course, with a different methodological approach. These different approaches which are faith on the one hand and experimentation on the other do intersect as there is a place in science where certain realities are accepted at face value (faith) and a place in religion where certain physical reality does not square up with revealed knowledge. This intersection is well represented in St. Anselm's motto : *fides quaerens intellectum*(faith seeking understanding). The intersection then can be a positive or negative one depending on the extent to which this exposes certain lacuna or aid the understanding.

The study seeks to interrogate the intersection of religion and science from a traditional African point of view bearing the etymological meaning of science and what the concept of energy portends especially in quantum mechanics. The idea is to delineate the extent to which traditional African sages had a clue about science as it is known today.

Religion and the External World

Religion can be understood as man's quest to know the supernatural creator and God who is above all things (visible and invisible). This makes it clear that

religion is a belief in or worship of a God; religion therefore becomes a way of life (culture). Religion from the Latin "re" and "ligere" meaning "to bind together" gives one a picture of man's desire to be bound to his creator in worship, knowledge, wisdom, power and might. Kurt argues that:

> Religious doctrines and institutions predate the growth of science, Christianity, Judaism, Islam, Hinduism, Buddhism and other religious traditions have deep roots in human history-sacred books, revered teachers and saints, the majesty of the arts; resplendent cathedrals, temples and mosques; and deep philosophical traditional are imbued with a cultural heritage that emphasizes the need for faith and devotion (12).

As expected, religion is concerned about the external world as almost all religions have a record of the origin and end of the universe. Some have even gone ahead to explain certain scientific laws found in the world whether rightly or wrongly. This is so because the creator of the world is seen as God, the Supreme Being, who put everything in place and sets them rolling in time. So religion is not devoid of scientific constituents or elements. Since God is held as the creator of matter, religion becomes interested in knowing the properties of matter though from a faith based approach and not from a scientific or experimental approach.

Religious beliefs about the world is contingent upon the revelation by the prophet(s) of God documented often times in a holy writ. These beliefs transcend the physical world into the supernatural realm. However, there is an evolution of religious belief such that what was once held as a truth has been modified with time due to an apparent scientific contradiction. Arising from this, Cragun made a remark that captures the relationship between religion and science thus:

> The relationship between religion and science is complicated. It is complicated by the fact that both religion and science have changed overtime and by the fact that neither may be said to constitute singular, uniform entities. While the boundaries of science are somewhat porous and it can be difficult to demarcate, what should and should not be included as science, religion is a broad term that refers to thousands of diverse organizations (172).

That religion deals with the external world can be captured in what that specific religion believes in as the revelation of the creative mechanics of the world. This

is why different religion agrees that God is the creator of matter but differs on how he created the material world. These differences are however negligible compared to the truth that God is the creator as some would argue. On whether religion provides in depth analysis of each created material is not given. Again, on the relationship between religion and science, Gyekye writes that "like religion and philosophy, science began in wonder: to explore the wonders of nature of the physical world. Religion and science are related in that both of them have perspectives on cosmic reality, even though there are several differences in their interpretations of reality" (1).

The point is here made that even though religion is faith based in the transcendental; it has a lot to do with the natural world. However, it lacks the capacity to go into details of what constitutes matter just as science has done. For example, religion can say something about a rainbow as a phenomenon with interpretation that God placed it in the sky as a covenant with man(Noah) that he will not destroy the world again with flood. But science, being naturalistic in its outlook, will interpret the phenomenon of rainbow in a manner that is thoroughly naturalistic and can be replicated.

Science and the External World

Science is concerned about taking off nature's veil. It does this by the building of hypotheses, theories and matching them with observable experimentation. Science is that discipline whose sole objective is to unearth nature's law as well as explaining, predicting and possibly controlling nature's ways. Since science is a human activity that is geared towards understanding matter and its constituents, science is systematic in its approach and this is where it is different from other disciplines. Over the years, science has employed very abstract mathematics in capturing the true essence of matter.

All the big names of science such as Galileo, Newton, Einstein, Planck, Heisenberg, Bohr, Schrodinger and so on used the language of mathematics to understand the external world which led into the breaking down of matter into molecule, atom, electron, proton, neutron and the further breakdown of these elementary particles of matter. Quantum physics or mechanics (the new physics) becomes the latest advancement in physics so that every other aspect of physics becomes a footnote. To this end, quantum physics or mechanics:

> Deals with propositions defined by processes of preparation and observation involving subject and object and obeying a new logic, not with

> objective properties of the object alone. Quantum mechanics deals with objective properties of the object alone, obeying the old logic, but they jump in a random way when an observation is made (Zukav, xxv)

The logic referred to above is that Newton who made it very clear that objects in everyday life do not move at the speed near that of light. Because of that, it becomes easier to measure the velocity and position of an object simultaneously a fact that cannot be achieved in the new physics. Francis Bacon was an earlier advocate of the inductive method of science where one starts with observations of individual cases, and uses these to predict future cases. It is this method that created a pathway for knowing the external world but it encounters problem in quantum mechanics because of the fuzzy logic by which these fundamental particles operates on. Dusek avers that:

> Although inductivism is probably still the most widely believed account of science among the public (although not as dominant as previously) inductivism has a number of logical problems. The most fundamental is called Hume's problem or the problem of the justification of induction. These are technical and may appear nit picking to the non-philosopher, but they are significant enough problems to cause many philosophers' of science (and scientists who have thought about these issues) to move away from straight forward inductivism (7).

One of the major debates in the philosophy of science is between realism and anti-realism, or following Karl Popper, between essentialism and instrumentalism, with regards to theoretical terms in science. Some aspects of science are particularly close to observation and experiment while other parts of scientific theory are only indirectly connected with observation and experiment through long chains of logical deduction. A very simple example is the term "electron" in physics. Scientific realists claim that the theoretical terms in science represent or refer to objectively real entities even if we cannot observe them. The anti-realists claim that the theoretical terms are not to be taken to literally refer to objects or entities. Instrumentalists on the other hand treat theories merely as instruments for prediction. For the instrumentalists, theories do not describe real, unobserved, structures but are more or less useful for prediction of things we can directly observe.

Consequently, science quest to come to terms with the external world is a hard way to navigate because the laws of nature and the instruments used are always

at variance. But that is not to say that considerable efforts have not been made to understand the workings of the external world. The technological innovations that are seen presently are as a result of understanding how matter works. This point is made lucid thus:

> Being a physicist, I knew that the sand, rocks, water and air around me were made of vibrating molecules and atoms, and that these consisted of particles which interacted with one another by creating and destroying other particles. I knew also that the Earth's atmosphere was continually bombarded by showers of 'cosmic rays', particles of high energy undergoing multiple collusions as they penetrated the air (Capra, 11).

The influence of modern physics extends to the realm of thought and culture where it has a deep revision in man's conception of the universe and his relation to it. The exploration of the atomic and subatomic world has revealed the limitation of classical ideas championed prominently by Newton which has necessitated a radical revision of many of our basic concepts such as matter, change, permanence, inertia, energy, consciousness, space, time, cause and effect.

Traditional African Worldview of Matter

Since matter is the fundamental concept in science, it will be fascinating to pry into traditional African worldview with the intent of understanding if this concept is given a prominent place in the matter of things. In the hierarchy of being or force in traditional Africa, matter can be situated in the realm of man, plants, animal as well as mineral resources. All of these are understood from the principle of vital or life force. The material dimension of the African universe is very well acknowledged but not given so much prominence as that of the immaterial realm. Archibong and Mchia note that:

> African interpretation of being is predicated more on the supernatural or religious. Its hierarchy of being begins with a Supreme Being at the apex with man at the third row and plants, rocks and animals at the lower wrung of the ladder. This shows the emphasis placed on being by Africans and by extension, the reason why she resorts to supernatural explanation for physical phenomena (5).

Traditional Africans engage with the world of matter undoubtedly. They live in a material space and carry out their activities materially like farming, building, fishing, cooking, movement and so on. But whether traditional Africans find the exigencies to reflect on matter and its properties can generate a debate.

However, what is common knowledge is that matter is understood from a supernatural or spiritual point of view. This is to say that the supernatural realm is seen as more pervasive than the physical because of the understanding of life force which permeates through matter. Nkemnkia made the point that:

> The world, in virtue of its being divine by participation, offers itself as intelligible reality and at the same time, capable of knowledge. Man's definition of the world is always insufficient, for the very reason that, if he were not already in the world, he would not be able to speak about it. In any case, if we have to give a definition of the world, then we should look for it among those that consider the world as an entity of reason, in virtue of creation (133).

That the material dimension of the universe is very much known by traditional Africans is a truism. They know matter as solid, liquid or gaseous. But this knowledge it would appear is just a common sense or naïve one. This is so because of the thinking that material reality is lower than spiritual. The spiritual dimension of reality is more elevated and given a serious place of prominence in comparison to matter. The world of matter in traditional Africa is viewed from the law of the supernatural. This is one of the major limitation or set back in traditional African worldview of matter. Onyeocha avers that "in many African societies, it is believed that the universe is divisible into two: the visible and the invisible world. The invisible world is the realm of the divine, of spirits and of ancestors…the earth with the hills, and the mountains, the rivers and the seas, and the birds of the air, beast of the fields and fish of the seas" (170).

The Intersections

Are there points at which certain discovery of the traditional African worldview of matter gives a clue about what modern science has discovered either as hypotheses or theories? First, science as it has been affirmed in the preceding passages is the systematic inquiry into the laws and workings of nature through observation and experimentation employing the language of mathematics. From the above, the points of intersection for religion and science would be summed up as follows: hypotheses or theory formulation, observation, experimentation and mathematical accuracy. From the African metaphysical disposition, it can be asked if there is such element as: spiritual force in science? It is important going forward, to xray the truth presented below:

> In cartoons, creativity is often signified by a light-bulb going on over the head of the hero. It is supposed to represent the flash of inspiration.

> Scientific discoveries are likewise typically characterized as occurring suddenly in dramatic creative leap of imagination, a flash of insight or a kind of 'aha' experience. The classic example is that of Archimedes the great Greek Scientist of the third century BC…(French, 8).

The place of creativity cannot be undermined in the discussion of scientific discovery. A lot of scientists who are famous today for one discovery or the other came about their "Eureka!" moments through some kind of light or inspiration that seems to be away from the description of matter. The question to be posed here is: are there men in traditional African society who through this divine spark of wisdom discovered a fundamental law of the universe? The argument will be that there is no way of actually verifying this since traditional Africa did not do much with regards to the written tradition such as the westerners developed. This is a serious challenge as it can be argued that traditional Africa is replete with a lot of sages (wise men) who discovered the secret workings of the universe but who did not document their findings.

This limitation can explain why hypotheses and theories in traditional Africa cannot be determined easily because of the communalistic posture of traditional Africa where knowledge is community based and not individualistic. With regards to observation, traditional Africans are good in that aspect especially common sense or naïve observation of the heavenly bodies from where they can predict when the rain will fall or if there will be draught. At other time, the journeying of birds can signify a change of season so that it becomes easier to know if there will be high yield of crops or torrential rain. Another major challenge however is that, physical observation is often given credence by spiritual inquiry. This is where the issue of pouring libation and making inquiry from the gods come into play. Archibong and Usoro corroborate this point when they state that "in the explanation of reality, that is, in an attempt to give a theoretical grounding for why things happen the way they do and why it is believed, traditional Africans revert to spirits as westerners revert to science. Spirits are to traditional African thought what material particles are to western scientific system. Traditional thought invariably makes recourse to personal spiritual explanations to account for practical or empirical events (225).

In the area of experimentation, traditional Africans are engaged in such too but not thoroughly. It can be better explained as a case of cause and effect scenario where one tries to understand why certain phenomena turn out the way they do.

Even at that, the experimentation angle to an inquiry still terminates with the gods determining the outcome of a situation. So there is no serious effort made to make experimentation that are innovative and life changing maybe because hypotheses and theories are missing in the first instance or that critical attitude and disposition is absent. Hutten makes an interesting remark about science which tends to the truth thus:

> Western civilization is distinguished from all other civilization by the fact that it has science. Religion is an ingredient of all civilizations. The arts and crafts have reached as high if not a higher, level in the East as in the West. Basic practical discoveries like paper, gunpowder and the compass have in fact come to us from China. But science is a unique feature of our civilization and we owe it to the Greeks (11).

Mathematics has a long history as emerging from Egypt with its other components like geometry and arithmetic being very familiar in Greece. Just as African Philosophy draws its inspiration from ethno-philosophy so is effort being made today to see the relationship between ethno- mathematics, which is found in traditional Africa, and modern mathematics. Traditional Africa is replete with knowledge of arithmetic especially in the computation of numbers which had practical applications in all her life endeavors. But whether mathematics was developed like it was done by the Greeks is worth searching. What is known however is that mathematics was taken to a whole new level by the westerners who used it to discover, organize and interpret profound aspect of nature. Stewart asked: "why should such abstract formulations, seemingly divorced from connection to reality be relevant to so many area of science? Yet they are" (111).

Natural science has become more sophisticated because of the contribution of mathematics which has done a lot in capturing the aspect of science that might escape common sense observation and experimentation. Energy physics is one that is very delicate and where mathematics has had a profound effect. Energy in modern science has a close affinity to vital force or spirit in traditional African worldview and this seem to be where the intersection of religion and science is easily discernible both in the African and Western traditions. This perspective will form the evaluation and conclusion of the paper.

Evaluation and Conclusion

It is interesting to note that despite the quantum of knowledge that abound at present about the world and the successes recorded by science, "the visible world is neither matter nor spirit but the invisible organization of energy".(Pagels, xiii). Energy is akin to life force which animates matter and makes it functional. This life force is very well known in traditional African thought as it has hierarchy of categorization. Force is both material and immaterial in traditional Africa. While science has discovered that energy is at the foundation of matter, traditional African sages knew that point though in a way that is not subjected to bringing about benefits in the material sense.

Energy as potential and kinetic (latent energy and energy for work) is a principle that operates in the world of matter. Energy becomes the intersection point between traditional African worldview of matter and that of modern science. Isife notes that "there is a natural radical interpretation of science and mysticism in every thought. As such, there is science in African traditional philosophy just as there is mysticism in modern scientific culture" (102).

Religion in traditional Africa is widespread and Africa is considered to be notoriously religious. Traditional Africa's culture is framed from its religious inclination. Religion therefore, affects every aspect of traditional African life including the world. The resultant effect is that, African culture is replete with religious undertone so that every phenomenon is given a religious interpretation. This becomes a very serious limitation for traditional Africa as this attitude has not encouraged the independent observation and falsifiability of theories and nature's laws.

In conclusion, traditional Africa had ample opportunity to traverse the realm of matter by its conscious and systematic inquiry like it was done in the West. The West and by extension the Orientals are very religious but they were able to separate religion and science. They rather made serious use of the common intersections between religion and science to be able to strike a balance. Today, the world has been drastically changed by natural science and appropriate technology. Contemporary Africa can borrow a leaf from the westerners and intentionally invest in homegrown scientific research in order to be a team player in the global space. There is nothing wrong in seeing the world from a religious perspective. But everything is wrong if the world is viewed from only one mode.

Dynamism in knowledge production and furtherance is key to progress and development and that is what science bequeaths to its handlers.

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