ON CAUSALITY AND SCIENCE: TOWARDS A DECONSTRUCTION OF AFRICAN THEORY OF FORCES

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ABSTRACT
Against the background of the need for scientific and technological development, this essay examines African metaphysical theory of vital-force and its principle of interpenetrability, and questions how such a metaphysical system can constitute the basis for pure rational systematic empirical science and technology. The essay further argues that the metaphysical notion of causality informs a people's notion or approach to science and technology. Consequently, in view of the fact of the religious, mystical and spiritual nature of African metaphysics, there is the need to evolve the culture of intellectualism which emphasizes the rigour of the mind, not the dynamisms of spirit, that is, if Africa wants to radically address the question of a sound metaphysical foundation for science and technology. In essence, the essay aims at the demolition of African metaphysical theory of forces and rebuts the argument that the culture of intellectualism (i.e. the metaphysics of pure reason) is responsible for the invention of a dehumanizing science.

The Metaphysical Foundations of Causality
We begin by juxtaposing two concepts (metaphysical notions) of causality: West versus Africa. Within the ambit of Western metaphysics, causality is viewed from a this-worldly standpoint. In fact, causality is seen as a physical order of reality which is perceptible and can be rationalized. On the other hand, African metaphysical notion of causality is agentive. Ancient Africans viewed causality from other-worldly perspective. The traditionally African understanding of causality is religious, supernatural, spiritual, mystical and mythical. Making an evaluation of the concept of cause and chance among the Yoruba people of Nigeria, J.O. Sodipo rebuts Robin Horton's assertion that whereas: “Western science has mastered the inert or inanimate world, in traditional Africa, only human society obeys the rigid laws of nature, meanwhile, the forces of nature remain uncontrollable and unpredictable”. Sodipo opines that the traditional African was not particularly concerned with cognitive problems, but with religious and mythical ones. In essence, the African is not after the satisfaction of his emotional needs nor is he interested in the physical questions of causality as in discovering motives and motivating and motivated agents (who are held responsible for an event and why they do it). Even in the game of pure chance, nine Africans out of ten would attribute their luck or misfortune to a god or the gods”(Sodipo, 12 – 20; cited by Anyanwu, 1981: 147 – 148).

The above point is further buttressed by K. C. Anyanwu who maintains that contrary to the Sartrean (Western) notion that man is the creative drive or force behind his own freedom: “In the African view, whatever force he (man) acquires is given to him by a superior being who already possesses this force, just as any diminution of his force is the result of some evil-intentioned agent capable of destroying one's force. Hence, it can be said that the African...
conception (of causality) is essentially religious” (Anyanwu, 1981: 149). For traditional Africans:

Force is not communicated or reduced primarily by some form of physical causality, because force does not belong to the physical order. It is metaphysical. It is therefore not accessible to scientific or empirical verification. It belongs to the order of invisible entities which cannot be known but believed in; which cannot be rationally proved, but only revealed by tradition; which cannot be coaxed into action by exercising a direct causal influence on them, but only by symbolic and ritual (quasi-sacramental) form of causality (p 150).

The life-line of African metaphysics is that causality cannot be rationally and empirically perceived or conceived, but only spiritually intuited through the consultation of the supernatural. Thus, the world of aesthetic quality and aesthetic continuum imply the transmutation and transformation of forces. In such a world the form of entities is altered by the animating and de-animating dynamisms of spirit or force. What the West regards as lifeless or inert is for the African alive, energized by spirit. This explains why witches can affect one psychically, it explains why hunters appease the spirits of their hunting tools, it explains how it is possible for sorcerers to use objects as vessels for executing their evil intentions, and it also explains why Africans appease the spirits of the land in order to ensure social and spiritual balance.

When we say that traditional African metaphysical notion of causality is religious, mystical and spiritual, we do not intend in any way to denigrate African metaphysics. This point has been severally reiterated by African philosophers at different periods. These philosophers, among who are D. E. Idoniboye, John Mbiti and Placid Tempels, join their voices to those of Sodipo and Anyanwu to buttress the supernatural and anthropocentric nature of African metaphysics. For example, Idoniboye captures the spiritual nature of African metaphysics in the following words:

The ontology of any distinctively African worldview is replete with spirits. Spirits are the one entity that remains constant in all African belief systems (1973: 83).

The spiritual nature of African metaphysics stems from the fact that “Africans regard spirits as part of the furniture of the world, not merely as local constructions out of certain unaccountable manifestations” (Ibid.). It follows then that the cardinal point of African metaphysics is spirituality. Idoniboye captures this more succinctly when he says:

Spirit is real. It is as real as matter. Its reality is primordial and it is if not superior at least as primitive as that of matter... Spirit is the animating sustaining creative life-force of the universe. It is what gives anything its individuality (Ibid. 84).

Further, John Mbiti who describes the African as unrepentantly and notoriously religious characterizes African ontology as religious and anthropocentric. According to Mbiti:

Africans have their own ontology, but it is a religious ontology and to understand their religions we must penetrate their ontology... this
anthropocentric ontology is a complete unity or solidarity which nothing
can break up or destroy (1976: 15 & 16).

By the term anthropocentric, Mbiti implies that African metaphysics, though, spiritual, is
nevertheless man centered. In which case, African metaphysics is intended for the attainment
of spiritual harmony, and social cohesion and solidarity, intended to attune the individual
towards the attainment of mental and emotional balance. The anthropocentric nature of
African metaphysics stems from the hierarchicization and interpenetrability of forces. Man
and the society are the centre point of gravity, the coordinating points between the higher
spiritual realm of God, divinities and ancestors, and the lower spiritual realm of animals,
plants and mineral resources. This explains why Tempels compares the African cosmos to
the network system of the spider's web of which the vibration of a string shakes up the whole
edifice (i.e. causes social and spiritual imbalance). But the question is, legitimate as African
metaphysics is, how does its notion of causality apply to science and technology?

African Notion of Causality and the Questions of Scientific and Technological
Development

Human beings are naturally endowed with intelligence. By implication, it follows that man
has the natural capacity for invention. It is this ability to forge ideas that constitutes the basis
for development in general. In essence, science and technology are something inherent or
intrinsic in human nature. This fact is buttressed by ancient civilizations such as Egypt,
Babylonia, China, India and so on, which not only blossomed before the rise of Greece, but
pioneered the disciplines of the Arts and the Sciences. Just as with traditional African
societies, these civilizations were able to invent a brand of science and technology based on
spirituality, and the agentive notion of causality.

However, the rise of Greece marked a turning point in the history of science and
technology. The point being made is that the demarcation between the pre-Greek era and the
Greek era signifies the distinction between primeval (spiritual) science and technology
founded on agentive metaphysical doctrine of causality and rational systematic empirical
science and technology established on an intellectual metaphysical notion of causality. The
march towards rigorous, systematic science started with the Greeks some two and half (2500
BC) millennia ago. In contrast to the pre-Greek period, “early Greek philosophers were
concerned with explaining the phenomena of the perceptual world rather than offering
recipes for practice and they did so by invoking causes rather than invoking agents or
divinities” (Encyc. Brit. 366). Thus, the departure from myth and religion and the search for
first principles or ultimate causes, distinguished the Greeks as the precursors of modern
science.

What the above submission amounts to is that spiritual or mystical metaphysics and the
doctrine of agentive causality are legitimate in the sense that they constitute the foundation of
spiritual science, but definitely, not rational systematic science and technology. The reason
for this is not farfetched. The laws of the spirit are different from those of the intellect, just as
the purpose of spiritual science differs from that of intellectual and systematic science. The
whole difference lies in the ontological and epistemological foundations of spiritual
metaphysics and rational contemplative metaphysics in relation to the form (i.e. eidos) of
things.

In simple terms, spiritual metaphysics takes spirit to be the primordial form or primary
idea of all entities in the world. It regards spirit as having primacy over matter. For this
reason, one who operates within the ambit of spiritual ontology and epistemology sees the
world as organic and the entities in it as sacred. This kind of world-outlook stems from the fact that the spiritual metaphysician or epistemologist believes that everything in the world is endowed with life-forces and might in actual fact perceive the life-forces of these entities. This explains why the spiritual primacist conceives of a symbiosis of life-forces. On the other hand, rational contemplative metaphysics and epistemology conceive of the form or idea of a thing or things purely from an intellectual point of view. In other words, the form of a thing is not its spirit but the idea the perceiver and knower has of the thing in question. By implication, whereas the epistemic outlook of spiritual metaphysics easily leads to the deification and veneration of the forces of nature, contemplative metaphysics and epistemology encourage the intellectual appreciation of entities and forces of the world. It is through this latter method that man not only acquires mastery of his universe, but goes ahead to impose his will on nature by transforming the universe to suit his own purpose. It is the urge to reduce drudgery and tame the wild forces of nature, as opposed to the spiritual mastery of these forces that leads to a profound culture of science and technology.

To illustrate, we draw examples and make comparisons between classical Western and traditional African approaches to the questions of science and technology. Within the ambit of classical Western philosophy, concentration on pure rational contemplative metaphysics and epistemology led to the emergence of systematic science and technology. Thus, beginning with the Greek cosmologists and hylozoists, focus was directed on the intellectual explanations of the laws of nature. Various elements - water, air, fire, logos, earth, apeiron etc - were posited as the basic substrata of the universe. Such an effort attained maturity in the philosophies of Plato and Aristotle under whom the tradition of developing comprehensive cosmological systems of thought began. Plato is known for his theory of eidos (i.e. form) and Aristotle for his theory of hylomorphism (i.e. matter and form). The purpose of these notions of form is to explain the fact that it is our intellectual orientations (not spirit) that lead to the transformation of the universe. This sort of tradition was sustained in the modern period by philosophers such as Francis Bacon, David Hume, J. S. Mill, Rene Descartes, Leibniz, Immanuel Kant and a host others.

Kant is particularly credited for having resolved the conflict between idealists and materialists as well as between rationalists and empiricists. The upshot of Kant's transcendental ontology is to show that finite pure reason is the alpha and omega of all inventions (be it mental or physical). In fact, Kant depicts a turning point in the history of classical Western philosophy. He altered the epistemological quest for the foundation of science into a metaphysico-epistemological one. Instead of the usual question: “What can the mind know”? Which is intended to explore the method, limit and validity of human knowledge, Kant was concerned with the question of: "What the human mind can do”? Which is why he asked the question: “How is metaphysical synthetic a priori knowledge possible”? The important thing however, is that the modern period of Europe lived up to its name as - the second phase of hylozoism. The rapport between philosophers (as theoreticians) and scientists (as field researchers) led to great inventions and the rapid development of Europe. Consequently, it is not out of place to submit that science as it exists today is a European achievement and it has enjoyed continued progress for almost 500 years.

On the contrary, the story of science and technology on the African continent is quite different from what obtained in the West. However, before we embark upon the delineation of the philosophical orientation of traditional Africans to science and technology, we shall pause awhile to make certain clarifications as follows:
(1) For the fact that traditional African metaphysical outlook is predominantly spiritual, religious and mystical does not imply that traditional Africans could not develop a practical and pragmatic epistemological outlook.

(2) To say that traditional African metaphysics is spiritual does not imply that Africans are incapable of abstract thinking. It simply means that traditional Africans, paid little attention to such mental orientation.

(3) If we combine (1) and (2) above, coupled with historical antecedents, the problem is not with whether traditional Africans were great inventors or not, the real problem is simply this: if we grant the fact that a sound theoretical foundation informs practice and leads to rapid and sustainable scientific and technological development, why couldn't traditional Africans develop such intellectual orientation?

John Mbiti and Kwame Gyekye are of the view that the religious nature of African metaphysics notwithstanding, Africans have a practical and pragmatic approach to life. Mbiti uses the term anthropocentric to qualify the functional nature of African ontology. Gyekye on his part wonders why such empirical epistemological outlook could not yield profound and extensive interest in the acquisition of theoretical knowledge which is the foundation of empirical science. Gyekye's amazement is further compounded by the fact that traditional Africans were known for their great talents, skills and inventions. According to Gyekye:

Observations made by them (traditional Africans) may have led to interesting facts about the workings of nature, but those facts needed to be given elaborate and coherent theoretical explanations. Science requires explanations that are generalizable, facts that are disciplined by experiments, and experiments that are repeatable and verifiable elsewhere. But the inability (or is it lack of interest) of the users of our (African) culture to engage in sustained investigations and to provide intelligible scientific explanations or analysis of their own observations and experiences stunted the growth of science (1997: 27).

The purpose of metaphysics is to name reality. Needless to say, a people's interpretation of reality determines their notion of causality and their sum-total approach to life. A people whose metaphysical interpretation of reality is spiritual will definitely see the world and events therein as the interplay of spiritual forces. This way of conceiving reality has a grave disadvantage in the sense that it beclouds the mental vision of the African from searching for physical causes which is the basis of systematic science. This is the major difference between the African and the European. The search for physical causes or the interpretation of reality from a this-worldly point of view enlightens the European to the fact that the factors responsible for change can be investigated and comprehended by man. The European is then awakened to the fact that it is only man as man properly situated and in total control of his universe that can surmount the vicissitudes of life no matter how complex. On the other hand, the search for spiritual causes or the interpretation of reality from otherworldly standpoint led to the belief that problems are best investigated, interpreted and comprehended through the supernatural. In essence, without the supernatural which depicts omniscience and omnipotence, man is incapable of surmounting the vicissitudes of life that confront him.

The point made above is buttressed by Kwame Gyekye who observes that: “Science begins not only in sustained observations and investigations into natural phenomena, but also in the ascription of causal analyses of those phenomena. This notion of causality is, of
course, very crucial to the pursuit of science” (Ibid. 27 – 28). He further states that Africans quite appreciated the notion of causality but understood and interpreted it from a mystical standpoint.

The consequence of this was that purely scientific or empirical causal explanations, of which the users of our culture were somehow aware, were often not regarded as profound enough to offer complete satisfaction. This led them to give up, but too soon, on the search for empirical causal explanations even of causal relations between natural phenomena or events - and to resort to supernatural causation. Empirical causation, which asks what- and how - questions, too quickly gave way to agentive causation which asks who - and why - questions. Agentive causation led to the postulation of spirits or mystical powers as causal agents; so that a particular metaphysics was at the basis of this sort of agentive causation (Ibid. 28).

The point is that the principle of interpenetrability of forces espoused by African metaphysics does not make a clear cut distinction between the physical and the spiritual. This point is substantiated by Mbiti who opines that within the African metaphysical cosmos: “The physical and the spiritual are but two dimensions of one and the same universe. These dimensions dovetail into each other to the extent that at times and in places one is apparently more real than, but not exclusive of the other” (Mbiti 1976, cited by Gyekye, 1997: 28). Kwame Gyekye also accentuates Mbiti’s assertion. Gyekye argues that the lack of a clear-cut distinction between the physical and the supernatural led to the postulation of agentive causation and the identification of spirit as the agent responsible for change in the physical phenomena. For Africa to squarely address the problems of science and technology, Gyekye opines that Africans must evolve, internalize and inculcate the culture of intellectual transcendence, not spiritual transcendence. Accordingly, Gyekye concludes as follows:

In view of the critical importance of causality to the development of the science of nature, a culture that was obsessed with supernatural or mystical causal explanations would hardly develop the scientific attitude in the users of that culture, and would, consequently, not attain knowledge of the external world that can empirically be ascertained by others, including future generations (1997: 28).

Furthermore, a people’s approach to science also determines their appreciation of technology. For instance, the search for physical causes constitutes the background to the intellectual attitude of seeking for profound theoretical explanations. This explains why Western approach to science and technology goes beyond practice to the explanation of the physical laws behind the processes of science and technology, and the formulation of theories, principles and hypothesis to direct researches in science and technology. Sefa-Dede, a female Ghanaian food technologist who specializes in the investigation of traditional methods of food technology, also makes this point. According to Sefa-Dede, in most cases, the method of food technology applied by traditional food technologists may differ from that of the modern food technologists but the principles which underlie these methods may be the same. To buttress her point, Sefa-Dede cites the example of a local commercial food maker who specializes in the cooking of *fante kenkey*, a staple Ghanaian food made from fermented maize. Sefa-Dede who went with a research team was given a poser by the local woman to solve which goes as follows:
Imagine that you have loaded a 44-gallon barrel with uncooked fante kenkey. You set the system up on the traditional cooking stove, which uses firewood. The fire is lit and the boiling process starts. In the middle of the boiling process you notice that the barrel has developed a leak at its bottom. The boiling water is gushing into the fire and gradually putting off the fire. What will you do to save the situation (1993; cited by Gyekye, 35)

Sefa-Dede and the research team provided different answers none of which could have saved the situation. Unloading the barrel would have been impossible given the fact that the fante kenkey was already very hot and another barrel may not be immediately available etc. The local woman provided the answer. According to her “What is to be done is to adjust the firewood in the stove to increase burning, then collect two or three handfuls of dry palm kernels and throw them into the fire - these will heat up and turn red hot; finally, collect coarse table salt and throw it into the hot kernels. The salt will explode and in the process seal the leak at the bottom of the barrel” (Gyekye, 35). Sefa-Dede gives the scientific name of the solution provided by the woman as \textit{sublimation of salt}.

Kwame Gyekye makes evaluation of the example given by Sefa-Dede and drew the following observations:

1. As it concerns the issue of food preservation “the technologies deployed by traditional food technologists undoubtedly involved the application of the principles of science - physics, chemistry, and biology - which the users of the techniques may not be aware of” (\textit{Ibid.} 34). In other words, traditional African technologists knew the act but not the idea, or form, or the theory behind the act. This is evident in the processes employed in preservation which is meant to rid food items of harmful micro-organisms and fungi. Of course the traditional African food technologists know there were such things as microorganisms which cause food items to sour and spoil, which is why they resorted to food preservation, but they were not interested in the study of those microbes or the processes by which they (microbes) get to decompose food materials.

2. As it concerns the example of the leaking 44-gallon barrel and the burning of handfuls of palm kernels and coarse table salt to seal up the leak, Gyekye observes that the whole process involves the application of the laws of physics and chemistry. This is beside the point that traditional metal smelters, blacksmiths and goldsmiths are known to use palm kernels to heat and melt various metals, nevertheless, they never bothered to investigate the theoretical foundations of these practical processes. Gyekye therefore concludes that our traditional technologists - food technologists, smelters, herbalists, brewers etc, “must have thought that the 'whys' and 'hows' did not matter and that it was enough to have found practical ways to solve practical problems of human survival” (\textit{Ibid.} 36).

The point is that if spiritual metaphysical world-view led to a religious notion of causality, and if this in turn hampered the development of a theoretical orientation for the critical evaluation of science and technology, then there is the need to adopt a new approach in the handling of science and technology by contemporary Africans. But the question is; how do contemporary Africans go about the development of this new orientation?

Need for Deconstruction

The contemporary period can be described as the era of deconstruction because it is in this age that postmodernists and postcolonialists in Europe and Africa seek to demolish and
reconstruct the metaphysical foundation of Eurocentrism. The demolition of a Eurocentered metaphysical orientation is considered a top priority on the ground that such exercise will aid the rapid overcoming of most of the conflicts that bestrade the globe.

The point being made above is that most African scholars and philosophers (among whom are, Senghor, K. C. Anyanwu, Aime Césaire to mention but a few) see abstract rational thinking which thrives on critical and rigorous intellectualism as alien to Africans. For this group of thinkers, it is the concentration on the extolment of reason by classical Western philosophers that led to the establishment of spurious metaphysical systems which sowed the seeds of discord, encouraged racial discrimination and inequality, and also promotes the attitudes of absolutism and impositionism. This position is further substantiated by the fact that classical Western metaphysics and epistemology dichotomizes subject from object, man from his world, God and his angels from man and the cosmos, the clergy from the laity, shepherd from flocks, the elect or select from the wretched or downtrodden of the earth etc. By dissecting reality, by detaching the seer from the seen, classical Western metaphysics fans the embers of world destruction, because, by instituting the traditions of monism and reductionism, it (classical Western metaphysics) promotes the temperament of intolerance, fixism and dogmatism. It is this sectarian orientation that creates the divide between the intellectually and biologically superior West and the intellectually and biologically inferior African. By implication therefore, the civilized West should proceed to civilize and colonize the primitive and uncivilized African. In the light of this, Afrocentric scholars, poised to deflate the foundations of what they consider a spurious metaphysics and a barbaric culture, and in dogged defense of African philosophy and African culture, posited that emotion is African.

But the truth is that contemporary African scholars are not alone in the demolition and reconstruction of classical Western metaphysics. In fact, phenomenology and postmodernism are also poised in the battle to deconstruct traditionalism and Eurocentrism which constitute the foundation of pre-contemporary Western philosophy. The evils of Eurocentrism (in particular) are well articulated by phenomenologists and postmodernists alike whose singular aim is to demolish the philosophical foundations that led to such degree of barbarism. However, whereas phenomenology, particularly, Heideggerian phenomenology, aims at the total destructuring of classical Western metaphysics with a view to establishing a new philosophical foundation which is more accommodating and humanistic. Postmodernism on its part is poised for the complete destruction and departure, from the culture of seeking for primordial origins. In the thinking of the postmodernists, it is only the complete departure from the tradition of seeking for primordial origins that will put an end to the establishment of absolutist and dogmatic philosophical foundations which propagate the temperament of intolerance. Only when such is done could individuals and groups, be properly placed to live meaningfully within their own cultures.

If we collapse the positions of the phenomenologists, postmodernists and postcolonialists, it would be seen that the three schools of thought abhor the metaphysical orientations of classical Western metaphysics and the evils it propagated. However, whereas post-independence African political thinkers argue for the complete rejection of reason, the postmodernists and phenomenologists on their own part seek for the total departure from the traditions which encourage the negative application of reason. And whereas post-independence African scholars portray extreme bitterness, phenomenologists and postmodernists argue for new orientations that will put an end to acrimonies and rancour.

Consequently, it will be fool-hardy to totally reject reason and embrace emotion. The fact is that without the exercise of the human intellect, mankind would find it difficult to master,
understand as well as explore and exploit the resources that make up the universe. Without the application of reason to matters such as science and technology, how would man be able to reduce drudgery and help himself to overcome the fear of the forces of nature? Under the orientation of spiritual metaphysics, man was hemmed-in by myth and fear, terrorized and intimated by the forces of nature, which he deified and venerated as divine, supreme and supernatural. Needless to say, emotion does not suffice in any measure as a foundation for the profound cultures of science and technology.

Borrowing from the Heideggerian notion of *ale-theia* by which is meant that phenomena reveal themselves in profiles, in bits and in aspects, it follows that what the history of Western philosophy portrays, is the unconcealment of an aspect of reason. Nothing on its own is good or bad. It is the use to which a thing is put that makes it good or bad. Therefore, the fact that the traditional and modern Europeans had absolutized reason and in the process created orientations which propagate intolerance, in no way implies that reason is evil. In other words, there is no justification for the rejection of reason and the blind adoption and defense of emotion. After all, reason is nothing but a vital essence of the human entity.

By way of conclusion, it is to our own peril if we fail to exercise, explore and exploit, to advantage and for the good of all, that which constitute part of our own very essence. Not when the rest of mankind are soaring into space. What we need most is to explore our power of transcendence, to demonstrate the power of reason in turning misfortune to great fortune. But in going transcendental, in forging new orientations for the future, we must as a matter of necessity, avoid the pitfalls of the past. This can be done by developing orientations that abhor acrimonies and rancour. Most importantly we have no choice in the matter but to deconstruct the orientation which does not enable us compete healthily in the affairs of the world. The world is but passing phases and when situations change, man, the creator of situations, should re-evaluate his old ways and forge new perspectives for surmounting world problems.

**Works Cited**


