

Western and African Conception of Cause and Effect: Impact on Scientific Development

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Abstract

Science being an offspring of culture necessarily carries the imprint of culture. The cultural beliefs of a society mould and shape the contours of science in that society. It determines whether science in that society would grow into a giant Iroko tree or remains a stunted shrub. This work through the methodology of critical investigation, takes a look at the Western and African understanding of cause and effect in an attempt to unravel the impact of each belief-system on the development and growth of science in their respective areas. The work concludes that science blossoms in the West, because of its empirical orientation and remain stunted in Africa because of its penchant to throw causal explanation to the spirits. It recommends that Africa would need to change this world-view to enhance scientific knowledge.

Introduction

The cause and effect conundrum is an issue that has perennially engaged the minds of scholars and intellectuals for eons of years. It is an issue that is ‘transhistorical’, ‘transcultural’ and interdisciplinary. It is simply a universal discourse – with different cultures having their own peculiar conception of it.

Since science is a part of culture, it is intrinsically tied and determined by the culture of the area. That is, how science is done and how it fares in a given locality depends on the culture of that environment. Thus there is certainly an imprint of culture on every scientific activity. This implies that careful examination of any scientific activity would reveal the culture of the particular scientist or group of scientists carrying out the scientific activity.

Cause and effect is the fulcrum of almost all scientific activities. Almost all scientific explanations are done through a cause and effect analysis. Almost all scientific investigations too are geared towards explanation of the cause of a given observation (effect). Because of the importance of cause and effect in the scientific enterprise, it is easy to see that an individual understanding of cause and effect would definitely affect his/her scientific investigation and explanation. This paper would be making an attempt using the philosophical methodology of critical investigation to explore the cultural world-views of both the West and Africa with the intent of showing how the growth in science in these areas have been affected or influenced by their peculiar conception of cause and effect.

Conceptual Analysis

Cause and Effect. The Encyclopaedia of Religion and Ethics defines cause to be “an object, event or process, in virtue of which some object, event or process comes to exist or occur” (Vol 3). The Oxford Advance Learners Dictionary defines effect as “a change that somebody or something causes in somebody or something else” (6th ed). It also defines cause as “the person or thing that makes something happen”. For Mackie, cause is “associated with the

idea of something producing or bringing about something else (126). Omoregbe sees it as “that by which something (an effect) is produced” (22). Ijiomah sees it as either necessary or sufficient reason or the proximate initiator of something (85).

All the definitions above allude to the fact that a cause is an event or action prior to the occurrence or emergence of the effect. And the effect is the product of a cause. This could be illustrated using this example: Mr. A after an autopsy was found to have died of poison. Poison here becomes the cause of the death of Mr. A and the state of being dead becomes the effect.

Science is a term derived from the Latin word *scientia*, meaning “knowledge”. It is a systematic enterprise that builds and organizes knowledge in the form of testable explanations and predictions about the universe (Wilson, *Consilience: The Unity of Knowledge* 49). It is the human effort to understand the material world, with observable evidence as the basis of that understanding. Science is a systematic and logical approach to discovering how things in the universe work. Unlike the arts, science aims for measurable results through testing and analysis. Science is based on fact, not opinion or preferences.

Cause and Effect in the Western Thought

Though the concept of causality had existed in Pre-Socratic philosophy, it was Plato who first articulated the principle of causality as follows: “everything that becomes or changes must do so owing to some cause; for nothing can come to be without a cause” (*Timaeus* 28a). Plato however, only emphasized the causal importance of formal causes; asserting that nothing can exist unless there exists a changeless model of formal causes of which the particular sensible phenomenon is a mere representation (appearance).

The term causality actually gained eminence through the works of Aristotle. In the *Physics*, Book 11, Aristotle enumerated his famous four causes which are; the material cause, the formal cause, the final cause and the efficient cause. Aristotle stated that, in reference to any particular entity, the question ‘What is this?’ could be answered in four different ways, each of which corresponds to what he calls a ‘cause’ in the sense of ‘something without which the thing would not be’. Thus, given a marble statue, the question ‘What is this?’ could correctly be answered in one of the following ways: ‘This is marble’, ‘This is what was made by Phydias’, ‘This is something to be put in the temple of Apollo’ and ‘This is Apollo.’ These answers are the answers to four different questions, respectively: ‘What is this made of’, ‘who made this?’ ‘What is this made for?’ and ‘What is it that makes this what it is and not something else?’ (*Physics* II.3,194b23-195a3). These answers have come to be known as, the material cause, the efficient cause, the final cause and the formal cause respectively. The material cause is an answer to the material composition of the thing, the formal cause answers for the form or shape of the thing, the final cause answers for the purpose for which a thing is made; the efficient cause is the agent through which the thing is made. As noted by Omoregbe “today the word cause is restricted only to one of the four causes, the efficient cause” (Moorage 23). Because only the efficient cause has features we now associate with the idea of causation.

Borrowing heavily from Aristotle’s treatment of cause and effect, other philosophers like St. Thomas Aquinas, John Locke, John Stuart Mill, Rene Descartes, David Hume, Immanuel Kant et cetera have dealt variously on the issue of cause and effect. Their views are vast and diverse but we would not plunge ourselves into the discussion of these views. We would however wish to say summarily along the line of Nagel, that the Western conception of cause and effect could be subsumed into the following characteristics. For there to be cause and effect, there must be:

1. An invariable or constant relation in the sense that whenever the alleged cause occurs, the effect must also occur.

2. The two events must occur in approximately the same location or at least be related by a chain of events that are spatially linked.
3. The two events must be temporally related such that the cause precedes the effect in time just as the effect must follow continuously from the cause.
4. The two events must have an asymmetrical relation in that the occurrence of the alleged cause must be the actual event, which brings about the effect, such that the effect must not be part of the original conditions that are necessary and sufficient for its own occurrence (Nagel 51-52).

These relations as shall be seen shortly are hardly present in African conception of causality, especially when the cause and effect is ascribed to supernatural agencies. The distinguishing feature of Western concept of cause and effect is its empirical orientation.

Cause and Effect in African Thought System

A typical African though also believes in empirical causation as the Westerner but he goes further than this to ascribe causation to non-empirical realities like God, deities, ancestors, witchcrafts and other spiritual agencies. This view of causality is influenced by the African general perception of the world. Africans see the world as that of "extraordinary harmony, one of synthetic unity and compatibility among all things (Unah 107). It is a world where everything is seen as "dovetailing into one another" (Ijiomah 76). In this world, the Africans see events as being "determined by the will of spiritual beings, the operation of automatic forces, and the self-willed actions of men and other animals, which follow in orderly and comprehensive sequence" (Akpan <http://interesjournals.org/ER/pdf/2011/january/Akpan.pdf>).

The African perception of the world therefore influences his causal explanations of events, which tend to embrace both the material and spiritual plane of existence. Sogolo points to this fact when he wrote:

An African healer may attribute a disease to a successful natural cause not dissimilar to the germ theory of modern medicine. Yet the healer may also believe that the same disease is caused by supernatural forces, and would then proceed to cure the disease in these two seemingly incompatible ways (182).

In other words, the traditional African believes in the empirical (natural) idea of causation following the Western rules of causation we outline above and he also believes in supernatural causation which is not analyzable in empirical terms. Sogolo made this more vivid, by dividing these levels of causation into primary and secondary levels. The secondary causes are similar to the empirical causation of the Western type and the primary causes are attributed to supernatural entities such as deities, spirits, witches et cetera.

It should be noted here that though the African in most cases explains an event through both the primary and secondary levels of causation, but in some occasions he does explain reality only empirically. For instance, when someone out of carelessness cut himself with a knife or when someone out of stupidity is burnt by hot food. In these cases the African may explain these events in purely natural causation. But when the cut or burnt are considered intriguing and grievous, supernatural causes may be attached to the explanation. Helaine Minkus explains this better using the Akan world-view. He wrote:

If one person steps on a snake and is bitten, the occurrence may be ascribed to his carelessness and perhaps dismissed as happening without ulterior reasons. But if he dies from the snake bite it is more than likely that his own destiny or else witchcraft, sorcery or some other cause will be proposed to explain why such a thing should have happened (141).

A typical African therefore, explains causation from the point of view of secondary and primary causes. Thus, it is not uncommon to see a traditional healer, identify for instance, the secondary cause of an ailment as the consumption of some poisonous food, and also locate the primary cause to a malicious spirit or witch who influenced the individual to eat the poison. The primary cause may also be explained as a result of the anger of the gods over bridge of some taboos. In the Boki culture of Nigeria for example, there is the belief that certain actions are taboos and will bring down the wrath of the gods on the offenders. Actions like sexual intercourse in the bush, killing of a kinsman whether by accident or intentionally must be appeased or else the gods will strike the village. Sometimes malicious spirits are said to be capable of just attacking the community indiscriminately causing sickness, death and other maladies. This actually informs why the Boki people frequently perform the 'Atam Masquerade Dance'. This dance is believed to be capable of warding off evil from the community. The costume of the masquerade which is made of palm fronds will be laid at the end of the dance at the entrances to the village. This action for the Boki people blocks off evil that would have entered the village to cause havoc. The belief in the possibility of evil forces striking at random also explains why in Boki, weird names like: Kekong (toilet), Bukie (juju), Bebia (weeds), Dikan (bush), Orim (Satan) et cetera are common. These names are prevalent, because a Boki man believes that evil spirits strike only the children a parent loves most, which could be identified by their names. Thus for this cultures, giving unpleasant names to their children would deceive the evil spirits to believe that none of the children is loved, thereby protecting the children from attack.

In Africa therefore, almost all events are traceable to the spiritual including event like an accidental fall of a piece of yam from somebody's hand while eating would be explained in terms of the spirit. This could be attributed to hungry or angry ancestors. These are taken seriously as the real cause of the said effects.

The Effect of the Causal Explanations in the West and Africa on Scientific Development

Science like philosophy begins from wonder. This wonder instigates the instinct of curiosity which leads the mind to attempt an unravelling of this wonder. The successful unravelling of this wonder through rational and empirical means becomes scientific discovery or explanation. The empirical science generally follows the following methodology:

- Observations.
- Ask questions about the observations and gather information.
- Form a hypothesis which is a tentative description of what has been observed, and make predictions based on that hypothesis.
- Test the hypothesis and predictions in an experiment that can be reproduced.
- Analyze the data and draw conclusions; accept or reject the hypothesis or modify the hypothesis if necessary.
- Reproduce the experiment until there are no discrepancies between observations and theory
- Formulate a theory or general law.

After making observations of events, the mind instinctually would want to ask questions as regards the cause of the observation. The third stage which is answers to the questions asked in stage two determines the fate of science in an area. This is because the answers to the questions that accrue after observation would determine whether an observer would proceed in the investigation of the cause or not. Many Africans, because of their penchant to ascribe empirically verifiable event to the world of spirits end their scientific investigation at the third stage. For instance a typical African, upon observing a strange sickness in the village

would immediately attribute the cause of the sickness to evil spirits. This answer to the question, what is the cause of the sickness, naturally stifles the interest of the mind in empirical verification of the cause of the sickness. The conclusion of the mind would follow the following syllogism

The cause of sickness 'B' is from the world of spirits

The world of spirits is not accessible to all

Therefore, there is no need to investigate the cause of sickness 'B'.

As have been explained in the previous subtopics, almost all observations by Africans are explained transcendently. This tendency to explain events transcendently is arguably the reason why science is less developed in Africa than the West. This is so because, "ultimate explanation of cause and effect based on mythological-metaphysical approach erects an artificial barrier ab initio between what is empirically demonstrable and what is considered humanly impenetrable areas (Gyekye Philosophy 3). When causes are attributed to the spirits, then the mind tends to relax its quest for unravelling the cause, because the world of the spirits is considered humanly impenetrable areas.

The West on their part are able to cross the third stage of scientific investigation outlined above because of their empirical conception of causality. The West on encountering a sickness 'B' is likely to raise the following logical syllogism to reach a conclusion

The cause of sickness 'B' is from virus 'A' (hypothesis)

Experiment 'D' would determine if it is virus 'A' or not

So we would perform experiment 'D' to ascertain the cause of the sickness

It is clear from above that the hypothesis formed after the observation determines whether a given cause of an event is likely to be investigated or not. The cause is likely to be investigated if it is attributed to the material plane of existence, which is humanly penetrable, and unlikely to be investigated if it is thrown to the world of spirits which is inaccessible to people except for a very few individuals who are believed to have special gifts. Africans hardly investigate the causes of the daily phenomena they observed, because of their causal world-view that explains almost everything in terms of the transcendental. The transcendental world is accessible only to few people like the traditional priests and native doctors who are always unwilling to let others into the secret of the means to reach this world. Thus, with the cause of an event thrown to the world of the spirits and the means to reach that world closed up, and not open to everybody, an average African is scientifically incapacitated. Africa is not developed scientifically not because it lacks the intellectual capacity to do so; it is rather because of the cultural belief-system it is plagued with.

The West has made giant strides in science, because its causal world-view gives individuals the props and encouragement to explore and investigate the world. The world in this cultural world-view is not something that is guided and controlled by the spirits. This world is rather controlled by physical laws that could be investigated and explained. This kind of world is open for all to investigate, since it is controlled and ruled by physical laws – and physical laws could be investigated by everybody and not a privileged few as is the case of Africa. This openness in the causal world-view of the West is a powerful encouragement to all to explore their world for themselves and not to wait for juju priests and fortune tellers. The result of this has been amazing and hair-raising inventions and discoveries that are rampant in the West.

Conclusion

This essay advises Africa to shake off this excessive attribution of causality to the transcendental world. It is only when this is done that African science could blossom and compete favourably with Western science. At present, Africa is largely a consumer

continent. It exports raw materials and import finished goods. Even the crude oil explored in Nigeria is refined in the West and resold to Nigeria in finished form. This could be reversed if there is a change in world-view as regards cause and effect relationship.

We do not mean to say here that the West do not sometimes subscribe to transcendental causation, for at least they believe in God and anybody who believes in God sometimes ascribe causation to God. But what is distinctive about Western thought is that they do more of the empirical ascription than the spiritual. The Africans do more of the spiritual ascription than the empirical. In other words, the West is more empirically minded than Africa.

In the light of the above therefore, we could advice the Africans to complement empirical explanation with spiritual explanations. Causes that could be ascribed to the transcendental are those that have defied all mode of empirical explanation; like the case narrated by Chris Akpan, where a woman was discovered to have carried a key in her head. Diagnosis by the surgeon, Professor G. T. Ijadioha who carried out the surgery showed that the woman was not born with the key in her head (Akpan <http://interesjournals.org/ER/pdf/2011/january/Akpan.pdf>). Where the key comes from cannot possibly be answered through empirical causal explanation. This case and others could be helplessly thrown to the spirits as an explanation. But before this could be done, all modes of empirical explanation must first be explored

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