



## African indigenous knowledge systems and the quest for scientifico-technological development: the neglected dimension

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### Abstract

*African countries, like other countries of the world, possess knowledge systems that are indigenous to them, which are believed by many to have the potential for development. Besides having a coordinated outlet for transferring such knowledge, some claim that Africa is the origin of knowledge or the foundational ideas that rule the world scientifically and technologically. This claim, however, seems to be contradicted by the manifest poor scientific and technological state of African countries. Unravelling the reason(s) for this disconnect, therefore, forms part of the broader aims of this study. In this study, we examine African indigenous knowledge systems in the light of the current scientific and technological development. It is found that, unlike their Western counterparts that operate an open system, African indigenous knowledge systems have some occultic accretions that restrict access to them and preclude their custodians from publicly teaching and demonstrating their underlying principles for the consumption of the public. Relying on the nature and structure of the Egyptian Mystery Temple reputed for being a symbol of knowledge and wisdom in Africa, we argue that owing to their lack of a trial-and-error mechanism that underpins scientific and technological knowledge and development, African indigenous knowledge systems stifle scientific and technological development rather than encourage it.*

**Keywords:** *Science. Technology. Indigenous knowledge. Mystery temple. Closed system.*

## Introduction

Given that indigenous knowledge systems are potential tools for sustainable development, some scholars have noted that a nexus exists between knowledge systems and the development of the society/environment in which the knowledge systems are found (Breidlid 2019). If indigenous knowledge systems, as understood by some scholars, are the combination of knowledge systems that encompass technology, social, economic and philosophical learning, or educational, legal, and governance systems (Crossman, and Devisch 2002:8-9), then it can be posited that all varieties of development are products of some underlying knowledge principles. Since knowledge is a catalyst for development and human communities have some sort of knowledge indigenous to them, Africa as a community with knowledge systems believed to be indigenous to it is expected to be at par with, if not ahead of other continents in all indices of development. The reality on the ground, however, contradicts this expectation, even in the face of the common belief that technology means no more than the application of knowledge. Indigenous knowledge with its consequential developmental potential is transferable

given that the phenomenon of knowledge is, in general, transferable.

Considering available records, it is no longer in doubt that a good number of Western academic giants, including Socrates, Plato, Aristotle, Pythagoras, and a host of others passed through the Egyptian Mystery Temple from where they got the seed ideas of the philosophy they propounded (Eneh 1999; Onyewuenyi 1996). What gives cause for concern, however, is why Africa is still lagging scientifically and technologically when compared to the so-called countries whose intellectuals received their background knowledge from Africans, courtesy of the Egyptian Mystery Temple. What went wrong? Where and when did things go wrong? Working on the assumption that the West got her developmental ideas from Africans, we explore, in this paper, the reason or reasons why Africa could not develop at the rate expected despite her indigenous knowledge systems. The finding reveals that Africa's knowledge/educational system is shrouded in a high degree of secrecy which restricts access to it. Accordingly, it is posited that Africa can hardly grow scientifically and technologically if it does not replace its current secret-

oriented system of education with an open system that provides equality of access to all.

### **Conceptualizing Knowledge and Indigenous Knowledge**

#### ***Knowledge: Towards a Meaning***

Knowledge is an epistemological concept with a meaning that defies consensus among epistemologists themselves and scholars in general. Epistemology itself is defined as that branch of philosophy that explores the theory of knowledge. The simple question of what constitutes knowledge makes it clear that the concept of knowledge is not an easily definable one. Various attempts by scholars to define knowledge ended up enumerating instances of knowledge. Knowledge has been conceptualised as familiarity, awareness, or understanding of someone or something such as facts, information, descriptions or skills which is acquired through experience or education by perceiving, discovering, or learning. It can also refer to a theoretical or practical understanding of a subject. Implied in this definition of knowledge are such concepts as consciousness, awareness, understanding, comprehension, mastery or perception etc. (cf. Wikipedia:

<https://en.m.wikipedia.org>). The mere mention of knowledge as something that one can acquire suggests the idea of a setting or experience. By a setting here we mean an environment (formal or informal) meant for imparting or acquiring knowledge.

Three elements are involved in the process of knowing, or acquiring knowledge. These are the subject that knows, the object/thing that is known, and the mental act of knowing itself (otherwise called cognition). It follows from this that in the act of knowing there is a union between the knower (subject) and the thing (object) known. During this union, the object becomes present in the subject. Knowledge at this point, therefore, becomes awareness by the subject of the presence of the object in him/her. In epistemology, the presence of the object in the subject referred to here is not the physical presence of the object (as this is not possible), but the cognitional (mental) presence. Knowledge is of different types with each depending on its source of acquisition. Thus, we have empirical knowledge, rational knowledge, revealed knowledge, intuitive knowledge, and authoritative knowledge, among others.

Knowledge in our context here begins with our immediate awareness of things around us. It also presupposes the existence of an element with which we come to know what we know, just as it requires some form of training and guidance through the use of some specific methods. These methods differ from one society to another and from one epoch to another. The differences notwithstanding, the truth remains that no society can exist without them (i.e., formal education and guidance). Whereas in some societies the mechanism for instruction or imparting of knowledge operated in utmost secrecy (as was and is still the case with Africa), some societies adopted an open system (as was and is still obtainable in the West). The notion of knowledge is of high value to man. This is recognised by Pollock and Cruz (1999:1) when they declare that "it is the capacity for sophisticated thought that sets human beings apart from other animals" and that "only humans are capable of the kinds of cognition required to build an aeroplane or a microwave oven, to write Hamlet or compose a symphony, to propound the theory of relativity or discover DNA". Although there are many sorts of knowledge and different uses of the word "know", the sort of knowledge relevant to our

discourse, and which this paper will concern itself with, is the knowledge in the information sense. According to Keith Lehrer (1990:4), "it is knowledge in the information sense that is adjudged fundamental to human cognition and required both for theoretical speculation and practical sagacity."

### *On Indigenous Knowledge*

Knowledge is perceived as a product capable of being owned by both the individual and group or society. Critical analysis reveals that knowledge is a product that has both individual and societal dimensions. It is the realisation of this nature of knowledge that triggered off the raging controversy over whether consciousness is individual or community-oriented. This is another way of asking whether knowledge belongs to or originates from the individual or community. The possible inference from the preceding observations is that knowledge could be indigenous. And if that is the case, what then is indigenous knowledge? There is no all-embracing conception of indigenous knowledge systems (World Bank (1998). Zageye and Bamba (2006) conceived indigenous knowledge as the local knowledge that is unique to a given culture or society. For Flavier (1995), indigenous knowledge is

the information base of a society, which facilitates communication and decision-making. The author adds that indigenous information systems are dynamic and are continually influenced by internal creativity and experimentation as well as by contact with external systems.

Generally speaking, knowledge systems are systems through which people make sense of and attach meaning to the world in which they live (Kok 2005). The views and perceptions involved here originate within a specific community or culture, just as they are handed down from generation to generation, resulting in personal experiences and wisdom being transferred to younger people. Indigenous knowledge contrasts with the international knowledge system as generated by universities, research institutions and private firms. And, as Warren (1991) notes, indigenous knowledge is the basis of the local-level decision-making in agriculture, health care, food preparation education, natural resource management, and many other activities in rural communities. Indigenous knowledge is considered a vital aspect of the social capital of the poor, just as it constitutes their foundational asset in their bid to take charge of their destiny (cf. Gorfestani

2004). Besides forming the foundation of any country's knowledge system, indigenous knowledge is constitutive of the skills, insights and experiences of the people deployed to better their lives (World Bank 2004). Seen this way, there is a compelling need to promote the potential contributions of indigenous/local knowledge to the locally managed, sustainable and cost-effective survival strategies.

It has been argued that the inclusion of indigenous knowledge in the development process is informed by the claim that the Western knowledge-dominated scientific path in non-Western societies has failed to achieve its claim of the capability to deliver these societies from their development problems (Ewane and Ajagbe 2018:75). Granted that this is true, then local participation aimed at breaking the impasse becomes imperative (ibid). Ewane and Ajagbe argue that because indigenous knowledge has persisted up to the moment is a mark of its strength, as it showcases "its capacity in holistically resisting modernity" (ibid.). They further note that the invocation of indigenous knowledge in the development practice forges a corporeal disposition that makes up development practices. Its appeal in this case is seen in

its capacity to renew itself as one of the forces for achieving development in Africa (ibid.).

The World Bank in 1998 identified three levels of the relevance of indigenous knowledge which, in its estimation may be within the process of sustainable development, namely: (1) the local community where the possessors of such knowledge live and produce; (2) the various development agents such as governments, donors, local leaders and private sector initiatives (in their interaction with the local communities, these agents recognize the role of indigenous knowledge and, accordingly, value and appreciate it); (3) the global knowledge level ensures that indigenous knowledge forms part of global knowledge and, in this context, has a value and relevance in itself (cf Ewane and Ajagbe:76). This third level of relevance implies that it categorizes indigenous knowledge as knowledge that can be conserved, transferred and adapted beyond the shores of its origination. Ewane and Ajagbe (2018:76) further observe that indigenous/local knowledge acts as a force that determines how development is conducted in specific localities, and that the assumption that Western knowledge

provides the only route to development is confronted by indigenous knowledge's determinative capacity.

For Warren (1995), indigenous knowledge is local knowledge that is unique to a given culture or society, and it is the systematic body of knowledge acquired by local people through the accumulation of experiences – informal experiences – and intimate understanding of the environment in a given culture. According to Ewane and Ajagbe (2018), indigenous knowledge implies the idea of "local ownership" in development, as a "cultural and symbolic capital" in the development field where the interplay of indigenous and donor ideas produces outcomes. Indigenous practices are cultural capital for resisting the wholesale imposition of knowledge. The adjective 'indigenous' betrays the associated knowledge as one that is traceable to a given geographic location; as a phenomenon capable of being owned by one community to the exclusion of others; as something transferable or commercializable, and as a trade mark. Thus, in this regard, Bredlid (2009) opines that "indigenous knowledge is delimited geographically and culturally given that the emphasis is on place e.g. the homestead. Similarly, Sillitoe (2000:4) notes that indigenous

knowledge is as "much skill as knowledge and its learning across generations is marked by oral transmission and learning through experience and respective practice." While noting that scientific discipline is narrowly focused and capable of neglecting the interconnections of natural phenomena that may promote sustainable development, Sillitoe contends that indigenous knowledge provides a better alternative.

Similarly, Mapara (2009) conceives indigenous knowledge in terms of a body of knowledge that is peculiar to the indigenous people of a particular geographical area on which they have survived for a very long time. "It is local knowledge that is unique to a given culture or society" (<http://www.sedac.ciesin.columbia.edu>). Indigenous knowledge, therefore, is the knowledge that is particular, exclusive or unique to a given human society, which contrasts with the international knowledge system as governed by educational or research institutions. As a body of knowledge developed through the mechanisms of acculturation and kinship relationships put together and handed down from generation to generation, indigenous knowledge

systems serve as templates or bases for decision-making in diverse human disciplines at the local level. Such human disciplines include medicine, agriculture, education, politics, healthcare, transportation, commerce etc. It has to be added that indigenous knowledge, as the name suggests, has something to do with a belief system of a given society or group of people. Take the area enthrone of ethical control against theft, corruption, as well as other forms of crime in both private and public life of individual members of society, as an instance in this regard. Virtually every community in Igbo-speaking part of Nigeria has its peculiarly orchestrated mechanism in form of oath-taking at shrines by which it inculcates ethical behaviour among its members. In this regard, Ilogu (1975: 49) observes that "oath taking at the shrine of a chosen divinity is one of the methods employed by traditional Igbo society in obtaining sanctions against "destroyers" of traditional norms and moral provisions". This, to us, is a manifestation of indigenous knowledge.

Mawere (2010) likened indigenous knowledge to an adhesive that binds society as it indigenous knowledge) constitutes the communicative process

through which knowledge is transmitted, preserved, and acquired by humans in society. Indigenous knowledge is ethno in outlook as it makes a given knowledge an exclusive preserve of a particular society; hence its very name implies the linking of knowledge to the communities that produced it. From the foregoing, we may define African indigenous knowledge as a body of knowledge or bodies of knowledge that are indigenous or unique to indigenous African communities from which they emanate and to which they are linked. It is that sort of knowledge that is the consequence of complex kinship systems of relationships among African people, animals, the earth, and indeed the entire cosmos. Indigenous knowledge is known by such other names as "indigenous ways of knowing", "traditional knowledge", "ethno-science" as well as "people's science"(Mawere 2010).

Makista (2012) defines indigenous knowledge as "the traditional and local knowledge that exists and is developed through the experiences of the local community in the process of managing the conditions or contexts that challenge the people's everyday life" (pp. 209-210). From the above observations, it appears that Khumalo and Baloyi (2017) were correct when they noted that indigenous

knowledge accumulates over time due to a community's interaction with its environments, experiences, observations and trial-and-error testing which might not be in laboratories (p. 2). Indigenous knowledge has different forms of manifestation, which include medicine, agriculture, healthcare, commerce, crafts, skills etc. It has no doubt equally brought useful knowledge to bear on most of these mentioned areas of human enterprise.

The foregoing conceptualizations of indigenous knowledge are laden with implications. First, there is a close nexus of indigenous knowledge, epistemology, development and worldview (cf. Crossman and Devisch 2002; Breidlid 2009; Chivaura 2006; and Bourdieu 1997); in other words, there is a connection between indigenous knowledge and worldview, between indigenous knowledge and a people's epistemology, and between indigenous knowledge and development. A worldview refers to the way a particular community sees reality as a whole. A given indigenous knowledge system flows from the worldview of the cultural community within which the knowledge obtains. In other words, for the above authors, there is an interconnection between indigenous

knowledge systems and worldviews. They emphasize the need to understand African indigenous knowledge systems from the lens of the African worldview which, according to them is fundamentally religious. African worldview being fundamentally religious implies that it is realized basically in religious ceremonies, rituals and related practices. Religion and religious practices are central to Africa's epistemology or theory of knowledge.

### ***Scientifico-technological Knowledge***

The term "scientifico-technological development" is our special formulation or coinage to depict scientific and technological knowledge. No meaning other than this should be attributed to it. Similarly, in this paper, we use "scientifico-technological development" to mean scientific and technological development. The Oxford Advanced Learner's Dictionary of Contemporary English (6<sup>th</sup> edition) defines science as "knowledge arranged in an orderly manner, especially knowledge opened by observation and testing of facts. . .". In Nwala (1997:1), science is defined, among other things, as 1) a body of knowledge; 2) a method of acquiring knowledge or cognising (studying and understanding) the world; 3) an

instrument which enables us to practically transform the world in accordance with our purpose; and 4) an institution. Science is basically categorised into formal and empirical sciences. Whereas formal sciences are said to be systematic and deductive, empirical sciences are chiefly concerned with materials drawn from experience. In other words, empirical sciences deal with physical entities which are subject to sense observations and can be tested with instruments.

For technology, it is difficult to have a conception or meaning of technology which does not incorporate the idea or concept of knowledge. The term technology has been given various definitions by different scholars, all of which, put together, can be summarised as the understanding of technology to mean a systematic application of knowledge to our day-to-day problems. Ezeh (2001) offered a broad definition of technology as a systematic application of knowledge for products or services that serve a human purpose. It has been observed that technology cannot be different, higher, or more advanced than the knowledge behind it. This is in tandem with the saying that one cannot

grow or develop more than the information/knowledge one possesses.

### **The Egyptian Mystery Temple as a Centre for Education in Africa**

This section focuses on the place of the Egyptian Mystery System and the contributions of Africans to the birth of world civilization. But the aim is not necessarily to demonstrate that Africa had its own indigenous knowledge and also raised the foundational ideas that paved way for the scientific-technological development of the world; more importantly, it is to provide grounds for our argument that the mechanisms for African indigenous knowledge stifle, rather than encourage, scientific and technological development. The Egyptian mystery system is a sort of school or university established and staffed by the Egyptian priestly class wherein various disciplines such as mathematics, law, medicine, astronomy, physics, geometry, psychology, etc., were taught. Records have it that the Egyptian Mystery System, through its educational curriculum, served as a model for the world just as it attracted scholars from all parts of Europe, especially the Greek students (Eneh,1999:56). If science is an organised search for knowledge or rather the discovery and systematization of

scientific theories and concepts, and if technology is the application of these theories and concepts in the practical solution of human problems (Nwala ed.1997:8), then Africans not only have science and technology but also pioneered their development beyond Africa.

Egyptian Mystery System involved three classes of students, namely the "mortals", the "intelligences", and the "creators". Worthy of note is that as the name implies, the Egyptian Mystery System was shrouded in mystery and a high degree of secrecy. Certain aspects of its operations gave it an occultic stamp as could be seen in the ritualistic initiations that characterized entrance into the various classes in the school. Circumcision was a prerequisite for admission for foreign students. Eudoxus of Cnidos was even subjected to ritualistic shaving off his beard and eyebrows as part of the conditions for his admission into the mystery school (see Eneh 1999:64). It does not seem to us that women were allowed into the school. What is more, the academic contents of the curriculum were not taught outside the temple. In fact, the activities of the Mystery System were decked in high-profile secrecy, and the Egyptian priests were themselves the

custodians of these secrets. What obtained in Egyptian Mystery School is a case of the saying that "only the cardinals know what transpires in the conclave." As shall be seen later, the occultic aura that surrounded the Egyptian Mystery System, and by extension, the educational system, had some far-reaching negative implications on the status of Egypt, nay, Africa on the world map vis-a-vis the scientific or technological development of the world. Back to Africans' contributions to science and knowledge in general, it must be stated that history is replete with the giant strides they made. For instance, in the field of medicine, Africans contributed significantly to shaping the lot of humanity. Egyptians, for instance, had a highly organised body of medical knowledge. Imhotep who was credited to be the first physician of antiquity (Onyewuenyi 1993:51) laid the foundation of the medical oath. Today, this oath is otherwise called the Hippocratic Oath (after the Greek medical giant believed by the West to be the father of medicine). The status of this claim falls outside the scope of this paper. However, Imhotep was reputed for curing physical and mental sicknesses to the point of being venerated as a kind of

god, even many years after his death. Imhotep is not the only physician that Egypt produced. Onyewuenyi notes that Herodotus recorded that Egypt had many physicians, each specialising in the treatment of a given ailment. In the area of mathematics, Egyptians (Africans) already had a highly systematized body of mathematical knowledge that was the envy of the world, even before the Greeks produced the likes of Pythagoras in the field. Plato himself attested to the fact that Egyptian education in mathematics was superior to what obtained in the Hellenistic world. Citing Hamilton and Cairns (1961) in connection with this Plato's observation, Eneh (1999:63) notes that, "the mathematical knowledge of the Egyptian children stupefied Plato who, according to him, looked like a hog; he blushed not for himself but for the whole of the Hellenic world." Africans (Egyptians) equally had a solid astronomical base from where numerous astronomers were produced. In this respect, the Egyptians gave the world calendar months via their study of the solar system and the movement of the stars. In fact, Egyptians were the first to discover a solar year and portion out its course into twelve parts.

Further on the above, there exist some archaeological and other palaeo-historical pieces of evidence pointing to the fact that Africans pioneered and made effective use of some exact sciences. On this note, Ezeh (2001) remarks that studies of their (ancient Egyptians') pyramids, sphinx, sculptures, mummies and other historical remains astonish the present-day scientists. He also notes that there exists evidence that Africans had been able to sail to parts of America to the extent that could permit distance ocean voyages long before Europeans learnt navigation. Also, both archaeological and historical records indicate that the African system of writing predates that of the Greeks. From the foregoing, it is clear that we have adduced ample pieces of evidence to show that Africans had a highly organised body of knowledge that could in every respect be termed indigenous knowledge, which also served as a rich source from which other societies or cultures of the world benefited. The vexed question, however, is: with all these claims and pieces of evidence on Africans' pioneering role in knowledge, science and technology, for instance, why has Africa remained a dwarf in the modern-day world of science and

technology. This informs our reflection below.

### **Africa's Epistemological Orientation and the Quest for Scientifico-technological Development**

Chivaura (2006) observes that a nexus exists between epistemology and development, which accounts for the developmental differences between Africa and the West. Writing on how Africa's epistemological orientation impact sits developmental stride, he observes:

The African worldview declares that our world has two aspects: They are the physical and the spiritual. . . . The differences between African and European worldviews concerning earth and heaven relate to differences in their attitudes towards the material and the spiritual. Africans regard them as compatible. . . . The danger of adopting the European worldview to solve African problems is therefore obvious. It is hostile to our worldview and idea of development. African

development can only be achieved through an African worldview (p.217).

In the spiritual sphere, the ancestors play an important role, just as they guarantee that the social and moral world does not collapse and that the solidarity of the group is still maintained. This view is expressed by the likes of Chivaura, 2006; Mbiti, 1969; Idowu 1982; and Onyervnenyi, 1996. In the African metaphysical worldview, there is no boundary between the religious and the temporal, the spiritual and the physical. Given this observation, "a definition of indigenous knowledge, according to Breidlid (2009:14), must, therefore, both account for the holistic, metaphysical foundation (worldview) of indigenous knowledge systems and their various ramifications". In his estimation, indigenous knowledge systems, of necessity, encompass worldviews, cultural values and practices and knowledge systems derived from these worldviews and practices related to metaphysical ecological, economic and scientific fields (ibid).

In the light of the developing trendsvis-à-vis development, scholars have called for a revaluation of not only modern knowledge but also traditional knowledge

(Oguanyi, 1988; Jegede, 1995; Hountondji 1997; Odora Hoppers, 2002). Epistemologically, metaphysics and religion play an important role in the appreciation of African epistemology (Mbiti, 1969; Idowu,1982). Some scholars think that African indigenous knowledge systems as they are today pose some developmental challenge such that there is the need for a sort of reform or rebirth (Ntuli, 2002). Thus, when Ntuli (2002) came up with his popular phrase, "African Renaissance", he meant by it "a rebirth or renewal" to overcome Africa's current challenges and problems. According to him, the African renaissance "requires of us to re-examine our knowledge systems anew, with a view to extracting some lessons from our past to distil what can be of use at the current situation and what has to be jettisoned" (20002:54). But Africa's indigenous knowledge systems are so much anchored in a religious worldview that is bereft of objectivity needed for a broad-based scientific and technological development. There is, therefore, a need for a paradigm shift in our epistemological orientation.

**African Indigenous Knowledge and the Paradox of Scientifico-technological Development: Instances from Nigeria**

Concerning the different areas of human endeavour (agriculture, medicine, history, law, religion, astronomy, geometry, and mathematics) discussed above, we have provided enough evidence to demonstrate that besides having some forms of knowledge that are indigenous to them, Africans appear to have been the originators of the core ideas from where the religious, scientific and technological advancement of the world took off. All the same, we are bothered that despite all this, Africa's name is conspicuously missing from the list of the great country names of the world vis-a-vis science and technology. What went wrong? Where, when, and how? Is it the case that the borrower has become more managerial and consequently much richer than the lender? Or, does the problem lie in the operational methodology of Africa when juxtaposed with that of other countries? How do we solve this paradox?

Finding a solution to the above questions is our focus at this juncture. We shall start by first examining the enterprise called science, and then the nature of the so-called African indigenous knowledge systems, to find out whether those aspects of African indigenous knowledge systems claimed to be scientific really deserve this appellation. It is true that when conceived in a loose sense any

organised search for knowledge ranks as science. But it is equally true that such a conception of science is in the ordinary sense. A technical conception of science goes beyond that to see it as a body of knowledge that is arranged in an orderly manner. Knowledge in this context is with particular reference to the one gotten via observation and testing of facts. This conception of knowledge implies that the qualification for knowledge entails, among other things, objectivity, verifiability, factuality, quantifiability, systematicity as well as falsifiability. It follows from this that scientific knowledge strives as much as possible to provide man with the basis for explaining, predicting, as well as controlling phenomena (which in most cases are material). Any scientific knowledge that is worthwhile must rise above subjectivity, illusions, emotions and dispositions that characterize common-sense beliefs. It is basically in its materialistic and mechanistic view of reality (the world) that science differs from religion and metaphysics. The nature of science is such that it adopts the position that the universe is governed by laws in the same way that it is rational and systematic. In addition, it holds that with the aid of an instrument, every object and every phenomenon can be

observed in ways that make for an explanation, prediction and control. Implied in this is the idea that with science man can change the universe or any aspect of it following its laws. The attempt to change the universe to our taste or to suit our desires results in technological inventions. It follows from this, therefore, that any culture that embodies these and other scientific principles qualifies to be called a scientific culture.

The lingering question now is: do the African indigenous knowledge systems, especially their alleged scientific aspects, fit into the above picture? African worldview, especially in the past, is basically religio-metaphysical. In this view, the world, including its contents, is controlled by spiritual forces. It follows from this that to understand an object, one has to understand its spiritual essence. In the same vein, understanding and explaining an event or occurrence imply knowledge of the causal factor behind it. For the fact that Africa's worldview is religious, Africans tend to explain such phenomena as death, birth, misfortune, infertility, sickness, evil, etc. in terms of the will, actions and inactions of the gods, spirits, ancestors, etc. Most Africans equally consider the possession

of knowledge in some vital areas of life as a prerogative of god or the gods. This explains why they tend to believe that knowledge of the science of healing or curing certain elements is not available to all except those that have been chosen by the gods. This disposition equally extends to areas such as the exercise of powers believed to be magical and extra-human. Elaborating on this, certain individuals in present-day Africa, as was the case with the ancient era, are known or believed to possess such knowledge and powers as the one to cure snake bite, madness, scorpion sting, leprosy, epilepsy, pile, etc (this reflects the area of medicine and health care); the knowledge/power to prepare charms to prevent robbery attack, gunshot, machete cut; the knowledge/power to prepare charms for disappearing, fast money, promotion in the workplace (reflecting the area of business and defence); the knowledge/power to make rain, increase farm yields and productivity, preservation, etc. (reflecting the area of agriculture); knowledge/power for an alternative way of transportation, accident prevention (reflecting the domain of road safety), and so on. These knowledge areas have their counterparts in the western paradigm believed to represent an objective and universal standard. The

interesting thing here is that most Africans believe that these knowledge areas and their attendant powers are real and that those who possess the knowledge of such are the ones favoured by the gods. In other words, the possession of such knowledge with its attendant power is not available to all. What is more, even those who have the knowledge and power do not teach other people or the public the principle involved in the said knowledge, how it could be acquired, and how the power therein could be exercised. They usually claim that they are under an injunction from the endowing spirits not to disclose it to other people except to those whom they (the spirits) had already chosen or those that they (humans) themselves have initiated into the mystery. In one of his studies on the paranormal, the lead author of this article had the opportunity to interact with a self-acclaimed practitioner of the paranormal. The man told him that he possesses a lot of paranormal knowledge and powers, one of which is the power to travel to any part of the country without entering any vehicle or aeroplane whatsoever. If he goes to Lagos, for instance, and decides to come back when it is already late at night, say 11 p.m., all he needs to do is to make some incantations and, in a few

minutes, he will find himself in his house at Nsukka. Listening to him the researcher was fascinated, even though he doubted the reality of the man's claim. In pretence, he told the man that he needed such power to enable him to travel to any part of the country he wanted without using any public transport; that having such power would save him the transportation cost. He also told the practitioner man that he would like to take him to a forthcoming international conference where he was sure a lot of people, including foreign participants, would want to patronize him after he might have demonstrated or taught people how to acquire such knowledge/power. He was also told that after attending the conference he would become stupendously rich, seeing that many people would like to acquire such power because of the benefits it promised. Unfortunately, he told our representative that he would not be able to grant any of his requests because the rules of his practice as handed over to him by his forefathers and the endowing spirits forbade him from doing so. Such knowledge and the exercise of its attendant power, he said, were only meant for the initiates. The same man told our co-researcher of a fellow practitioner of the paranormal who had

the knowledge/power to fish out/recover whatever item that mistakenly fell into a latrine. He told the interviewer how the man in question has on three occasions recovered supposedly unwanted babies deposited inside different latrines by their mothers. He equally told the researcher how the same man recovered such items as keys and handsets that slipped off from their owners' hands and found their way into the latrine. Our colleague requested the man's contacts and these were given to him.

Upon meeting this other practitioner, the interviewer demanded from him an explanation of how such power worked and how an interested person could acquire it. Unfortunately for the interviewer, the man declined the request, giving the same reason as the person that referred the researcher to him, and just like him, hinged everything on the injunction from his forefathers and the spirits. This, perhaps, explains the situation that was obtainable in the renowned Egyptian Mystery System where admission was possible only after initiation. That is where our problem with the African educational system lies. It is shrouded in high-level secrecy, which explains why we fall out with those scholars who try to put the blame on our

intellectuals and colonialism. Worse still, some knowledge in African societies is characterized by gender, class, or village monopoly. By this, we mean that certain knowledge is deemed to be an exclusive preserve of a given gender, class, or village in Africa. For instance, in Nsukka Local Government Area of Enugu State of Nigeria, a certain village called *Umuova* is said to possess the knowledge and practice of waking up dead human beings (at least its own indigenes) to find out whether their death was natural or not; whether they were indebted to people or the other way around, etc. In ancient Egypt, and concerning the Egyptian mystery system, men, usually the priestly class, are the custodians of education and dissemination of (philosophic) knowledge. The point we are trying to establish is that African indigenous knowledge systems, especially as they concern science and technology, are classified in such a way that does not allow unrestricted access to its doctrines and operational principles. Granted they (Africans) have a good number of men and women with specialised knowledge that could easily pass for scientific knowledge, but the truth is that such knowledge remains unscientific and the results of its application abysmal or unpopular since the supporting principles

of such knowledge are hidden from the public scrutiny or unavailable to be subjected to the verifiability principle of pure science. If it is true as claimed that Egypt (Africa) is the birthplace of Science; that most of the renowned names in the Western world passed through the Egyptian Mystery Temple, why is it that they (the Westerners) and their countries have overshadowed Africa in virtually everything? The answer to this question, we think, lies in the fact that whereas Egypt and indeed Africa operated and seems to still operate a secretive system of education, the West operated and still operates an open system that is characterized by academic freedom. Although Ahyi (1997), Kolawole (2001), and Shrestra (2002), claimed that the failure of Africa's indigenous knowledge to aid development was a result of Western-induced marginalization, little did they know that they were simply stating the obvious about the nature of Africa's educational system and its attendant shortcomings. For instance, our thoughts agree with Ellen and Harris (2000) when they pointed out that Western science is depicted as being open, systematic, objective and very much dependent on a detached centre of rationality and intelligence, while the traditional knowledge (i.e., Africa's

Indigenous Knowledge) seems to be secretive, parochial, unintellectual, primitive and emotional. Shrestra, in relation to the nature of the African educational system, also averred that the missionaries mocked and made Africans ashamed of their indigenous knowledge and dismissed much of what is indigenously African as a fetish, and demanded of converts to rely instead on medication imported from Europe (p. 107). As for Ahyi (1997), the claim is that the West brainwashed Africans to the point of making them believe that Africa's medical practice is founded on sorcery. Such-induced mentality, he feels, has ended up making Africans depend on the West for almost everything and in the process enrich Western pharmaceutical companies, publishers, scientists and governments. Nothing can be closer to the truth than these observations from these erudite scholars. After graduating from the Egyptian Mystery System, the Westerners went back home and started putting the principles they learnt in Egypt to the empirical test. Just as what is today known as a community thought once existed as an individual thought; what is today classified as international knowledge was once local knowledge. Africans have knowledge that could be internationalised, but internationalisation

is more or less a product of objectively or near objectively verified claims or assumptions. Technology is nothing other than the application of knowledge for the production of ends that suit our desire or purpose. The raw materials have to be there first before the application comes in. The challenge before those African men and women who claim to possess some specialised knowledge and power in certain areas of human enterprise is to present the world with a blueprint or format that interested persons could follow to arrive at the same knowledge and power—the knowledge and power, for instance, to cure snake-bite, heal a cripple, appear and disappear, perform materialization, become impregnable to machete cuts and gunshots, etc. One of the major problems with African indigenous knowledge systems (as with most other indigenous knowledge systems) is that it is not only ethno-based and secretive but also exclusionist. Ezeh (2001) corroborates this when he noted that indigenous knowledge is usually reported as part of the culture and, as such, must be exclusive to a particular people or circle and recruitment beyond such a circle is usually prohibited. He adds that such knowledge is kept secret or even tabooed to the rest of society (p. 66). This is a case of a society presenting

indigenous knowledge as being exclusive to them. The implication is that adopting a position like this makes the knowledge in question lack that universal appeal that is the attribute of scientific knowledge. Again, knowledge continuity is not guaranteed within a conceptual framework of this kind as the death of the individuals in possession of the knowledge before passing it to others might bring an end to such knowledge in their community.

For some scholars, a basic problem of African indigenous knowledge is that it is underutilized (see, for instance, Battiste 2002; Hoet al. 2003; Wane 2005). Battiste blames Africans for the underutilization of the indigenous knowledge framework in Africa. According to him, the consequence of people disregarding their own knowledge and wisdom is that it slowly gets lost, just as it becomes prone to misappropriation. Hoet al agree with Battiste that although indigenous knowledge is an important component of development, it is grossly underutilized. Similarly, Wane argued that the cultural resource base and local knowledge of African people are the least valued for their contributions to knowledge production and the survival of

communities, especially when compared to their Western counterparts. While we acknowledge the truth of these observations, we object to the argument that African scholars are the reason for the underutilization of African indigenous knowledge, or that its underutilization is Western-induced. Such an argument, in our view, simply addresses the effects of a problem without first addressing its root cause. We have maintained that the foundational problem of Africa's indigenous knowledge lies in the secretive and occultic nature of its educational system. Unless the secretive stronghold of this system is thrown open to all, the problem will persist. Indigenous knowledge implies that members of the indigenous community are known to have intimate knowledge of their environment much more than any well-educated foreigner. The intimacy enjoyed here is as a result of a long year of familiarity and knowledge handed down from generation to generation (Ezeanya-Esiogbu 2019). According to Appiah-Opoku (2005), indigenous knowledge of the environment takes the form of "intimate and detailed knowledge of the environment, including plants, animals, and natural phenomena; the development and use of appropriate technologies for primary resource utilization; and a

holistic worldview that parallels the scientific discipline of ecology" (p.103). The question that results from Ezeanya-Esiogbu (2019) and Appiah-Opoku (2005) is: much as the intimacy and the detailed knowledge they advocated are good, how can they be achieved in the face of high-level secrecy surrounding knowledge and knowledge acquisition in African communities?

Another problem with indigenous African knowledge is that unlike mainstream science wherein knowledge production involves phases of experimentation through trial and error by the individual, the mode of transmission and sharing of knowledge is collective rather than individualistic, and the same applies to discovery and experimentation. Again, given its holistic socio-cultural and spiritual dimensions, indigenous knowledge appears to be relatively less transferable than conventional science (Emeagwali, 2003). Wane (2005) thinks that indigenous knowledge is spiritual, cumulative and collective knowledge. Hence for him, Africa's indigenous knowledge hardly relies on explicit hypotheses, theories, and laws. Batiste and Anderson (2000) share our position when they remarked that without ceremony and ritual songs, chance

prayers and the relationships that accompany healing ceremonies, outsiders cannot achieve the same effect. This is to say that African indigenous knowledge is communitarian in relation to motive. It provides excellent examples, to borrow Emeagwali's words, of community-based and community-biased research. And like all other indigenous knowledge systems, indigenous African knowledge draws its strength from the community vis-a-vis the discovery process and knowledge production.

By the same token, the lack of a legal/regulating framework poses a great challenge for Africa's Indigenous Knowledge Systems. The result of this challenge is that individuals skilled in traditional and spiritual therapies become lords of the terrain as well as the law unto themselves. The lack of a legal framework equally affects the application of indigenous knowledge by those who possess it in the area of patency. Even when there are patent laws in place, the undocumented nature of Africa's indigenous knowledge and practice makes the determination of who finds or discovers what for the purposes of assigning patent rights becomes difficult. Ochola (2007) and Sithole (2006) both recognize the challenge posed by the

absence of documentation and legal framework to the flourishing of Africa's indigenous knowledge. This takes us back to the "secrecy problem". Of course, you cannot document or regulate what you neither know nor have access to. This is where African indigenous knowledge is lacking because all the possessors of such knowledge/powers claim to have acquired them directly from the gods as the case may be.

### **On the Way forward**

Having identified where the problems lie, we now turn our attention to addressing how these problems could be solved.

### ***Mainstreaming***

To make indigenous African knowledge more wholesome, it is our considered view that it be integrated into mainstream science. Emeagwali (2003) suggested that since a good number of European philosophers have spent a good part of their time reflecting on and discussing the nature of reality, objectivity, and problem-solving in mainstream science, there is the need for us to do the same for African indigenous knowledge by rejecting, accepting, modifying or adapting relevant conceptual framework in the field and creating entirely new constructs for the

analysis and understanding the phenomenon where necessary.

### ***Documentation***

There is a compelling need for indigenous knowledge processes and principles to be documented. This will provide the public with access to the underlying principles and processes of indigenous knowledge as well as the *modus operandi* for exercising consequential powers. One of the benefits of documentation is that it makes it easier for a government that wants to integrate or incorporate indigenous knowledge into its educational curriculum. As Ezeanya (2015) rightly observed, education is the shortest and quickest path to ensuring social continuity and bringing about transformation in any society. The strategic importance of documentation of knowledge to any society that quests for advancement in science and technology can be seen in the event of the death of an alleged exclusive possessor and practitioner of a given indigenous knowledge. Monopoly over indigenous knowledge in the absence of a documentation mechanism means that with the death of a given possessor and practitioner of a certain indigenous knowledge the society as a whole will

suffer as no individual in that society will have access to the underlying principles and processes of the knowledge in question.

It follows that with documentation, society is not impoverished by the death of one person or group of persons. In this regard, and still on the importance of documentation, Khumalo and Baloyi (2017) submit that "there is. . . a need for information practitioners and other stakeholders in Africa to document indigenous knowledge and also make it accessible to Africans and other people around the world" (p. 9). We are of the view that such indigenous knowledge as the remedies to gunshots, machete cuts, road accidents, impotency, chronic diseases, lost items, infertility, etc. need to be documented and shared with the masses for the purposes of continuity and sustainability. In this light, Sithole (2006) advised that African communities should pursue documentation through a coordinated strategy which should be able to inform different actors in the field what the other members are doing and provide a platform for the storing or sharing of best practices and lessons learnt in different approaches undertaken.

### *Incentives*

Many individuals and societies lay claim to possessing certain indigenous knowledge which, if true, promises to be useful in advancing the cause of science and technology. Take, for instance, such indigenous knowledge claims as the power to prevent road accidents, to prepare antidotes for gunshots, machete cuts, poison, impotency, etc., the knowledge and power to make and prevent rainfalls, to appear and disappear at will, to wake up the dead for of interrogation, to recover lost items, to prevent thieves and armed robbers from residential buildings, and so on. We contend that if these claims are realistic, then there is every need for the governments of various states in Africa to deploy incentives that are powerful enough to compel the possessors and practitioners of the consequential powers of indigenous knowledge to unveil the underlying principles and processes of such knowledge for the greater interest of the society. In this regard, promises of adequate funding and granting of patent rights to protect exclusive knowledge discovery by individuals and society come to mind.

We suspect that fear is behind most of these possessors and practitioners of

indigenous knowledge who refused to unveil the underlying principles and processes of their practice. One such fear is the fear of the unknown. A good number of them may be entertaining the fear that their legacy will be stolen from them without adequate financial/material compensation. The second fear we feel they entertain is that what they have or possess is so precious that it should not be given away to third parties without an adequate guarantee that their ownership rights are protected. These very fears bring into focus again the ideas and necessity of documentation and putting in place a legal framework for guidance and regulation respectively. We, therefore, strongly suggest that government should, as a way of breaking the occultic wall barricading Africa's indigenous knowledge, guarantee the patent right and adequate funding to any possessor and practitioner of indigenous knowledge that is willing to disclose and document the underlying principles and processes of their knowledge and practice.

### **Conclusion**

In this paper, we have endeavoured to analyse extensively the concept of African indigenous knowledge systems in a way that demonstrates the reasons

why, rather than encourage scientific and technological development, they stifle it. In doing so, we referred to and examined the numerous arguments put forward by different scholars holding the notion that the origin of all knowledge is traceable to Africa (Egypt). The reason for doing so was neither to affirm nor deny such claims, but to demonstrate that even if the claims of the pro-African origin are valid, they have not in any way reflected in Africa's ranking in the world vis-à-vis scientifico-technological development. In our discussion, we were able to show reasons for this lacuna while suggesting some ways out. In their study of indigenous knowledge in Africa, Khumalo and Baloyi (2017) made a finding to the effect that Africa's indigenous knowledge is underutilized and somehow neglected in the developmental goals and projects (see p. 10). While we agree with this

finding, we object to their view that Africa's indigenous knowledge is underutilized because of over-reliance on products and knowledge from the West. For us, Africans' over-reliance on the Western products and knowledge is the consequence of a lack of access to the operating principles and processes of Africa's indigenous knowledge which, in turn, is caused by its secretive and occultic nature. It is on this secretive, exclusive, class-oriented nature of the African indigenous knowledge systems and lack of emphasis on their neutralization that we locate the neglected dimension in the quest for scientifico-technological development in Africa via Africa's indigenous knowledge systems.

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