African indigenous knowledge: scientific or unscientific?

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The conventional idea is that there is only one superior way of knowing. That is rational and scientific knowledge ... Yet, across the globe, people perceive reality in different ways, and the resulting worldviews lead to different ways of learning and different ways of knowing.[2]

Human knowledge within Western culture is generally adjudged to have reached its apogee in terms of the study of the natural world and the development of technological equipment directed towards making life worth living. Meanwhile, the attainment of such a sophisticated status in Western scientific research has been facilitated by its experimental methodology which has made possible the transfer of knowledge from one generation to another. However, other non-Western forms of knowledge that lack these characteristics are regarded as "unscientific". African indigenous knowledge, a victim of such censure, is seen as an unscientific accumulation of native wisdom, lacking in sophistication, logicality, coherence, and technicality which disqualifies it from being called "scientific" knowledge as we have it in Western culture. This paper seeks to argue that the rejection of African indigenous knowledge as "unscientific" knowledge stems from a false dichotomy.

Keywords: Africa, Indigenous Knowledge, Scientific, Epistemology and Culture.

Introduction

Our task in this paper is to critically examine assumptions and notions that stimulate the tension[3] between Western science and African indigenous knowledge in order to determine whether there are justifiable grounds for this tension. The challenge levelled against African indigenous knowledge (AIK) that it is inferior to Western scientific knowledge (WSK) has its roots in two important antecedents. The first can be traced to the consequence of the colonialist agenda in Africa and the self-acclaimed conceptual superiority of its benefactors over and above the people of the conquered territories. In fact, there were European scholars[4] who thought of Africans as a people so primitive that they could not even interpret their experiences in a logical and coherent manner and were accustomed to allow others to do the thinking and organize their experience for them.

This argument depicting African dependency on the West for structuralizing their conceptual schemes is well captured in the work of Placid Tempels[5]. In Tempels' view, if an African is asked to explain his world view on the nature of existence and the universe as a whole, one should not expect him to give a systematic account of his ontological system. But this does not in any way mean that such ontology does not exist; the African is only incapable of articulating his system of thought. He desperately needs help; this help lies in using Western paradigms and methods of analysis to systematize and logically present the primitive thinking of the African in a coherent manner. As colourful as this pattern of thinking is, it is simply an undisguised form of ethnocentrism, an offshoot of the colonial mentality which believes that Africans lack the general awareness or the possession of information and the acquisition of knowledge to transcend the bounds of credulity, and certain basic environmental limitations. This explication, in part, portrays the basis of the rejection of African indigenous knowledge as inferior to its Western equivalent.

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2. Bertus Haverkort and Coen Reijntjes, 2011, p.1.
3. Some important articles by notable African scholars further animate the views expressed in this essay. The following articles on the discourses of Africa published in *The African Philosophy Reader* (first and second editions), New York: Routledge, 2002; Editedby P.H. Coetzee and A.P.J. Roux, are important in this respect. They include: MB Ramose's "The struggle for reason in Africa", H.O. Oruka's "Ideology and culture: The African experience", T. Serequeberhan's "The critique of Eurocentrism and the practice of African philosophy", P.J. Hountondji's "An alienated literature", D.Kaphagawani & A.P.J. Roux "African epistemology", G.G.Sogolo "Logic and rationality".
4. Robin Horton, in "African Traditional thought and Western Science" points out two cogent reasons why European researchers, especially anthropologists, have failed to understand African traditional thought systems. First, he claims that many of them have been unfamiliar with the theoretical thinking of their own culture, which is a major handicap to their understanding of the African culture which they intended to study. Secondly, he affirms that even those familiar with theoretical thinking in their own culture have failed to recognize its African equivalents, simply because they have been blinded by a difference of idiom. This implies that the barrier of understanding how language is used in different cultures prevents the proper interpretation of conceptual schemes. See. Horton, 1998, p. 181.

The second one has to do with the response of African scholars to this Eurocentric bias as a way of showing that Africans are not unscientific and incapable of abstract reflection and are not in any way intellectually, culturally or ideologically inferior to their Western counterparts. This preoccupation has generated some polemics in African scholarship between those who have favoured the dogmatic veneration of African culture and those who took a divergent route. Those who believe that African culture should provide the raw data upon which any scientific and technological progress can be made are referred to as the traditionalists. However, those who believe that for any system of knowledge to qualify as scientific, it must be a product of certain systemic theoretical formulations, rigorous philosophical analysis, logical thinking, and critical reflection are referred to as modernists. Of particular relevance here is the agenda of the modernists. They intend to present African theoretical frameworks as similar to Western categories of thought using established scientific models. The implication is that all indigenous forms of knowledge must be similar to other Western categories of thought in order to qualify as meaningful. This situation of borrowing external theoretical paradigms for the characterization of African knowledge is what Paulin Hountondji refers to as an extraverted scientific activity; fabricating indigenous knowledge in an externally oriented manner "intended to meet the theoretical needs of our Western counterparts and answer the questions they pose" (Hountondji 2009: 8). Following this line of reasoning, it is difficult to see how African indigenous knowledge can be said to be scientific or sharing the same quality with Western scientific knowledge when it is still Western concerns and paradigms that direct the thrust of the African system of thought. It is from these two perspectives that the knowledge produced by Africans (AIK) has been criticized as being inferior to the Western alternative.

In fact there are some scholars who believe that an exploration of the conceptual structure of traditional African thought will reveal that science is absent from traditional African thought schemes (Oluwasanmi 1972:5). But in what follows, we reject such views by arguing that knowledge is a cultural phenomenon and in so far as Africans have a cultural understanding, they are also capable of scientific thinking. Human knowledge is a cultural phenomenon because enlightenment and sophistication, which are aspects of the cultural experience, are acquired through social means of education and the beliefs, customs, norms and traditions of a people are preserved, transmitted through this medium from one generation to another. Indeed, knowledge is a powerful human ideal which usually have a formative effect on the human mind. The acquisition of knowledge is power and power is a value that is highly sought after because of its massive potential to control and influence others. This explains why any culture that exhibits superior knowledge, whether scientific or non-scientific, over another is regarded as being in possession of power.

The idea of "knowledge-power" being stressed here portrays the nature of the epistemic tension between African and Western cultural epistemologies. This tension is generated by the rejection of African indigenous knowledge as lacking the elements of sophistication found in the Western scientific enterprise. This situation of the battle for the supremacy of cultural knowledge is what Masolo has recently referred to as "knowledge war"[1]. According to Masolo (2010:17), in a world where people travel carrying their cultural knowledge with them, knowledge wars are likely to ensue, and history tells us that there have been such wars, both within and between different cultures. It is this war within cultures that Snow (1990) attempted to bring to the fore in his work titled "The two cultures", describing the controversy between the scientific and the literate culture, while that between cultures is exemplified by the issue in focus in this essay. It is important to begin by attempting a clarification of the central notions in this article.

5. Placid Temples is widely regarded for his pioneering work on the Bantu people of Africa; his seminal work titled *Bantu Philosophy,* an exercise in ethnophilosophy, has a strong ethnocentric undertone in that it presents Africans as intellectually feeble and incapable of cognitive formulations of a world view on their existential status. He was so convinced that Western theoretical modes of thought need to be applied in investigating and interpreting African conceptions of reality that he boldly asserts thus: "We do not claim that the Bantus are capable of presenting us with a philosophical treatise complete with an adequate vocabulary. It is our own intellectual training that enables us, effects its systematic development. It is up to us to provide them with an accurate account of their conception of entities, in such a way that they will recognize themselves in our words". This assertion is as good as saying that Africans do not know anything – not even themselves or what happens in their immediate environment; in short that Africans are less human than Europeans. See. Tempels, P. 1969, p. 24.

1. By "knowledge war" we mean literally the struggle for knowledge. This struggle for knowledge is not necessarily between two distinct cultures (though our thematic focus is on this archetype); it could be a similar culture – where a group of people see themselves as being intellectually superior to "others" as is the case of the Oromo in Ethiopia. Although the Oromo have no political power, they are the largest ethno-nation in the Ethiopian population. Ethiopia, with the help of the European colonial powers, colonized and annexed the Oromo people during the last decades of the 19th century, when Africa was partitioned among the European colonial powers. Since then they have been treated as colonial subjects and second class citizens. With their colonization and incorporation into Ethiopia, the Oromo could not develop independent institutions that would allow them to produce and disseminate their historical knowledge freely. The point then is that Ethiopian knowledge elites with the support of the Ethiopian state produced "official" history that completely denied a historical space for the Oromo and other colonized peoples. See Jalata, 1995, pp. 95-96.

Conceptual clarifications

Western scientific knowledge and African indigenous knowledge

We regard both Western and African forms of knowledge as being cultural because knowledge is a cultural phenomenon – although both are produced within two distinct frameworks, they are not diametrically opposed. What this implies is that African modes of knowing are not dissimilar to other cultural modes of knowing. To maintain a contrary view will inadvertently mean that we are granting the thesis that all humans are not humans and that human beings can be ideologically inferior to one another along cultural lines. In this case, we conceive of both AIK and WSK as cultural epistemologies because they are products of dynamic levels of civilization or human awareness developed through unconnected geographical space. Western scientific knowledge (WSK) has a long-standing history which can be traced to the work and basic scientific philosophies of great thinkers like Galileo, Newton, Einstein, and Descartes, among other notable scholars. The modern sciences as we have them today emerged in Europe in the scientific revolution of the Enlightenment of the 17th century aimed at the empirical observation of facts. Knowledge within this scientific culture is accumulated through a rigorous process of rational inquiry, logical thinking, critical reflection, empirical perception, and the aptitude for abstraction. All these human abilities are applied in the investigation of phenomena, interpreting reality and providing meaningful hypotheses for further scientific research. The knowledge gained in this expedition is precise, theoretically rigorous, predictive and interpretive. The point being stressed here is that:

> With respect to modern science, the heart of the process is neither the stage of data collection nor that of the application of theoretical findings to practical issues. Rather, it lies between the two, in the stages of theory building, interpretation of raw information and the theoretical processing of the data collected. These stages lead to more or less complex experimental methods and machinery. Based on these procedures, statements are produced (Hountondji 1995:2).

The statements produced by science may be subjected to various tests and scientific investigation to determine not only their veracity but also accuracy. This is why WSK is described as having an empirical character in the sense that it follows an empirical research cycle in a methodological framework that combines induction and deduction to formulate researchable hypotheses based on theories and the systematic collection and processing of data. The empirical character of science leads to the systematization of knowledge through the deployment of mathematical models, cryptic symbols, and other mechanistic representations in order to explain natural phenomena. In this regard, the efforts of classical scientists like Galileo, Da Vinci, Newton, Bacon, Descartes and Einstein in popularizing the mechanistic character of science cannot be overemphasized. Looking at the history of science from a holistic perspective, it is evident that from the writings of Francis Bacon, through Enlightenment philosophies to nineteenth-century positivists, the progress of science demanded a favourable environment, which meant freedom of thought and publication, state protection and adequate rewards. In order that science would help transform social existence, a fundamental method was required to carry out this important function within society. This gave birth to the experimental method for science, its strongest weapon, fashioned by Galileo. According to Strømholm (1975), within the ranks of the saints of science the name of Galileo Galilei has always held a special place. The dramatic circumstances of his life, his crucial role in the transition from one world-view to another and the fame and influence of his works have all conspired to put him in his position of a cultural hero. Meanwhile, Newton may justly be regarded as a hero in science like Galileo for introducing the principle of inertia into theoretical physics, which is believed to have influenced Albert Einstein's discovery of the relativity theory.

> The principle of inertia was obviously an important element in Newton's mechanics and cosmology, and one might conceivably justify the claim that the arrival at this principle constituted the essence of the transition from Greek and Medieval thought to the incontestable modern science of Newton's *Principia* (Strømholm1975:346).

From the foregoing it is obvious that historic metamorphosis of modern Western science has its roots in the mechanistic conception of change and motion by some of these scholars. That is, much emphasis is placed on positivism and mechanism as a way of arriving at scientific knowledge. However, one shortcoming of this scientific tradition is that it pushed the bounds of the empirical method of science too far; in the sense that it became a categorical maxim for scientists to reject all forms of knowledge that do not correspond with the verification principle and the empirical method of arriving at truths. The positivist simply assumed that science is the only source of knowledge about the world. Even their discussions of the verifiability principle, which concerned demarcating science from non-science, presupposed that only science yields synthetic knowledge (Gutting 1990: 256).

Thus, it is on this note that AIK has been referred to as "non-scientific" and has been tagged with the epistemological status of being "traditional" and lacking all the paraphernalia of the scientific enterprise. So what then do we mean when we talk about AIK? Is it something inferior or similar to the Western scientific culture? There is a need to look at the nature of indigenous African knowledge in order to grapple with these issues. Generally, African indigenous knowledge (AIK) has been associated with African thought systems that are uninfluenced by alien accretions. The word "indigenous" would suggest to the reader that knowledge in this context is immutably fixed, immutable and reluctant to change over the centuries. In a sense, it could be appropriate to refer to this cultural epistemic framework as a sum total of the accumulated knowledge, or wisdom within a given communal, social or traditional setting. All around the world, ndigenous populations have lived in perfect harmony with nature. Over long periods of time these populations have acquired knowledge about the inner workings of their immediate surroundings or environment (Adesiji 2011:2). This is why it is defined thus:

> Indigenous knowledge systems are a body of knowledge, or bodies of knowledge of the indigenous people of particular geographical areas that they have survived on for a very long time. They are knowledge forms that have failed to die despite the racial and colonial onslaught that they have suffered at the hands of Western imperialism and arrogance. They are knowledge that was swept aside, denigrated by the colonialists and their sciences as empirical and superstitious as they sought to give themselves some form of justification on why they had to colonise other people's lands (Mapara 2009: 140).

This acquisition of knowledge comes through experience, familiarity and understanding of the ecosystem. In the words of Masolo, the term "indigenous" is used to define the origin of an item or person in relation to how their belonging to a place is to be temporally characterized, especially in comparison to other contenders in claiming belonging. What this means is that this form of knowledge is developed specifically by Africans in the light of all other existing cultural philosophies. This sort of explains why AIK has been referred to as a form of "endogenous knowledge" by Paulin Hountondji. According to him, "the term evokes the origin of the kind of knowledge in question by identifying it as an internal product drawn from a given cultural background, as opposed to another category of knowledge which would be imported from elsewhere" (Hountondji 1997:17). What this goes to show is that when we are talking about AIK we mean the kinds of knowledge that are developed by Africans, within a given cultural framework. As the World Bank's Knowledge and Learning Centre (1998) puts it;

> Indigenous Knowledge is unique to a particular culture and society. It is the basis for local decision-making in agriculture, health, natural resource management and other activities. It is embedded in community practices, institutions, relationships and rituals. It is essentially tacit knowledge that is not easily codifiable(1998: 8)).

There is practically no way we can talk about African knowledge as indigenous knowledge without making reference to the analytic philosophers' critique of African philosophy as a form of ethnophilosophy. The debate on whether AIK is different from WSK is a corollary of the question about whether African philosophy can be likened to Western philosophy in terms of method, rigour and theoretical analysis of issues. Although this debate has now been laid to rest, it is still rearing its ugly head through the modernist quest to determine the quality of anything tagged "African" by Western standards. One reason that is easily identifiable as being responsible for reference to AIK as ethno-thinking is that it grew out of tradition – a tradition immersed in the culture of orality rather than literacy. This culture of oral tradition through which AIK is preserved includes the following dynamics; moral values; participation in ceremonies, rituals; imitation; recitation; demonstration; sport; epic; poetry; reasoning; riddles; praise; songs; story-telling; proverbs, folktales; word games; puzzles; tongue-twisters; dance; music; plant biology; environmental education, and general forms of awareness derived from the task of observing the external world (Itibari 2006).

But this medium of preserving knowledge is believed to be largely prone to error, embellishments, emendation for personal reasons, and could also breed the idea of unanimity which prevents the development of a critical attitude necessary for social transformation; this explains why any form of knowledge developed within this cultural system is largely regarded as anachronistic and obsolete. The oral tradition in which African knowledge originally existed has also contributed to why AIK is considered inferior to its Western equivalent which has enjoyed a long history of writing. Thus, looking at other forms of knowledge through these same spectacles of literacy and sophistication attained in the Western world, would amount to methodical incommensurability. Since as Masolo (2010:24) maintains; to describe or characterize any knowledge or value as "indigenous" would mean to claim that it bears the desirable qualities of anachronism, self-representation, and self-preservation, which, by contrast, its "alien," "foreign," or "extraneous" counterparts lack. Now, we need to survey the issue at hand critically – the issue of whether African knowledge is

conceptually different from Western knowledge having pursued a conceptual analysis on the nature of both cultural epistemologies.

The cultural basis of the dichotomy between African Indigenous and Western Scientific Knowledge

In any situation of cultural collision, there is bound to be a clash of civilizations. As one dominant culture will perpetually seek to overshadow the sub-dominant "other", which often is the casualty of the clash of cultures. There is no doubt that the struggle for knowledge in Africa today is a direct consequence of the colonial experience that has brought about the African cultural crisis. This African experience which places anything with the appellation "African" or "Africans" in doubt and as substandard in the global market place shows that the tension on the accumulation of knowledge is culturally derived. The Western world has no interest in granting the status of "science" to African indigenous knowledge because it still wants to be in control of the power of knowledge which is best described by the sophisticated products of technology being produced in the Western world. This is what Samuel Hutington (2002) in his work titled: *The Clash of Civilization and the Remaking of the World Order* intends to depict when he suggests that the distribution of cultures in the world reflects the distribution of power. The point then is that since the Western world is interested in continued ownership of global power, it has to exert the superiority of its knowledge by refusing to grant other cultural systems of knowledge the status of scientific knowledge which drives social change. So anything that does not meet this standard is referred to as either traditional or inferior knowledge. But in response to this ethnocentric musing, we conceive of knowledge as a cultural phenomenon, and in so far as this is the case, scientific knowledge does not exclude the social context of knowledge as the Western world will have us believe. This is in line with the fact that "the striking difference between the long-term histories of peoples of different continents has been due not to innate differences in the people themselves but to the differences in their environments" (Haverkort, and Reijntjes, 2011:3). This is corroborated by Snow when he asserts that "the scientific culture really is a culture, not only in an intellectual but also in an anthropological sense" (Snow, 1990:5).

However, the response by Africans to the ethnocentric challenge has led to what Hountondji referred to as the epistemic culture of *extravertism* such that AIK is now wrongly being patterned after Western systems of knowledge in an unjustified manner. In this regard

> Scientific and technological activity, as practiced in Africa today is just as "extroverted" or externally oriented as economic activity. Most of the shortcomings that can be identified should not be perceived, therefore, as natural and inevitable. They should be traced back, on the contrary to the history of the integration and subordination of our traditional knowledge to the world system of knowledge, just as underdevelopment as a whole results, primarily, not from any original backwardness, but from the integration of our subsistence economies into the world capitalist market (Hountondji 1995:2).

There are bound to be problems with the integration of world cultures into the world system of knowledge because not all cultures have developed the skill of critical inquiry which is very crucial for the exploration of scientific knowledge. While scientific activity in developed economies is running at a massive pace in the Western world due to the development of specific scientific methodology aimed at further understanding nature and making human existence more meaningful, in Africa the scientific culture is at its lowest ebb. This disparity perceptible between these two cultural epistemic frameworks is what we have traced to the accident of colonialism which brought about a cultural dislocation in Africa. It is instructive to note that the one essential shortcoming of scientific activity in colonial Africa was the lack of specific theory-building procedures and infrastructures. Only the initial and final stages of the whole process were developed. No facilities for basic research, no laboratories and no universities existed in colonial Africa. We only had centres for so-called applied research that allowed, first, the feverish gathering of all supposedly useful information, aimed for immediate exportation to the so-called mother country research findings to some local issues. Even though there have been some improvements recorded in terms of universities and research laboratories carrying out scientific research in contemporary Africa, the current African situation on scientific exploration is not especially different from the past. African scientific research activities are directed towards the West in order to attract research grants from foreign host-institutions, organizations, and even governments; the sponsors in most cases tend to dictate the direction, scope and framework for such scientific research programmes (Hountondji 2005).

Another cultural factor that we have identified as principally contributing to the struggle for knowledge is the ethnocentric biases of discourse in modern science. The recent practice of distinguishing between "science" and "ethno-science" even within the Western scientific tradition is a pointer to this fact. Houndtonji observes that the development, within Western science, of a discipline or group of disciplines known as ethnoscience, including ethnobotany, ethnozoology, ethnomathematics, and the like, shows the only kind of relationship that could exist in the context of

domination between so-called traditional knowledge, where the latter is either marginalized or, better still, eaten by the former (Oladipo1999). So the question that one can raise here is this: why should there be the prefix – "ethno" before these scientific disciplines? This is simply a way of demarcating between traditional scientific knowledge and mainstream scientific knowledge; it is also a reflection of the fact that the ideas, achievements and thinking processes that have characterized scientific efforts in the Western tradition have contributed to its strong ethnocentric biases towards other cultural epistemic philosophies.

This demarcation is also to show that traditional or indigenous knowledge cannot be classified as science in the real sense of the world. But underlying such ethnocentric dichotomies is the desire to monopolize knowledge which is the source of dominance of other cultures. But why should there be a struggle for knowledge? It is because knowledge is crucial to human survival and flourishing. It is one of the means by which human beings seek to master and control their environment and regulate their social interactions. Indeed, without knowledge, human beings would hardly have been better than brutes. But the production, transmission and application of knowledge are not easy tasks; it is largely dependent on the development of the culture of inquiry. The culture of inquiry involves systematic investigations of phenomena – natural and social – with a view to enhancing our understanding of their nature. These investigations demand not only systematic observation of things and processes in nature and society; they also involve the use of reason to conceive of possible explanations to what we observe. Thus, the culture of inquiry is usually propelled by the pursuits of meaning. It involves seeking and purposeful effort aimed at creating a better world (Haverkort and Reijntjes 2011). It is upon this notion of the utility value of knowledge that AIK has been disregarded as a culturally inferior product compared to WSK which is thought to be culturally superior. It is from this same cultural perspective that AIK has been classified as inferior to WSK that we shall attempt a possible resolution of the tension between these two epistemic systems.

Towards a dispelling of the false dichotomy between the two cultural epistemologies

Essentially, in this work we maintain the view that the dichotomy between AIK and WSK which has led to the struggle for knowledge is unnecessary because knowledge is developed within a cultural context. We agree with Haverkort and Reijntjes (2011) that there is no fundamental difference between mainstream knowledge and other ways of knowing that are labelled as traditional knowledge, indigenous knowledge or local knowledge. Thus, human knowledge may at best be seen as an approximation to truth within a specific knowledge tradition and therefore no knowledge can make exclusive claims on truth or superiority. There have been some attempts by scholars to respond to this challenge of the disparity between these cultural systems of thought. One such attempt takes a cue from Paulin Hountondji's emphasis on the task of producing knowledge in Africa, which can be measured as both qualitatively and methodically up to standard with the Western knowledge system. It is believed that the external or extroverted orientation of the African indigenous knowledge, patterned after Western paradigms of knowledge, should be redirected towards an internal orientation. That is, African philosophers, thinkers and theorists should direct their efforts at the evolution of knowledge devoid of any external influence. Although Hountondji's effort in this respect is quite commendable, it has not totally resolved the crisis of the struggle for knowledge. In this article, we conceive of an additional way of tapering the gulf between these two cultural epistemologies.

Apart from directing efforts towards the production of non-extraverted knowledge in Africa, efforts should also be directed towards the re-discovery of scientific knowledge in Africa which should be harnessed with the on-going task of "producing knowledge in Africa". Why the need for the re-discovery of aspects of indigenous knowledge? This is expedient because during the colonial period in Africa, vital or important knowledge was lost with the loss of native cultures. There is historic and oral evidence to show that Africans have developed some forms of knowledge which can be likened to the present efforts of Western scientific knowledge in metallurgy. Metallurgy is the scientific study of metals, especially its structure and properties; it also entails the extraction of these metals from the ground and making things from them. Although there were preliminary attempts by anthropological archaeologists[1] to exclude Africa from discussions on the origin of metallurgy, there is now textual evidence to support the view that this scientific enterprise was found in indigenous African culture. In his article titled "Indigenous African Metallurgy: Nature and Culture", Terry Childs maintains that:

> Western observers have commented on the technology of mining and metallurgy in sub-Saharan Africa for over three hundred years, but Western awareness of the cultural dimensions of African metallurgy is much more recent. It was not until the looting of Benin City by the British expedition of 1897 that the outside world

1. One of such scholars that seem not to regard the African origin of metallurgy in a discourse on the early casting of iron is Thomas Read. In his article published in 1934 titled "The Early Casting of Iron: A Stage in Iron Age Civilization," he traced the history of metallurgy of iron as a prerogative of the European world after which it was transferred to other parts of the world like China and India.

> learned of the West African traditions of figurative art in metal, and not until the late 1940s that these traditions were first investigated by archaeologists (Childs 1993:317).

This observation by Childs corroborates what we have been saying all along in this essay, that is, the Western world's interest in keeping Africa perpetually under its inferiority radar led to the "tagging" or characterization of indigenous knowledge as "unscientific" even though there is evidence to the contrary. The origin of metallurgy has been traced to multiple origins like in Nigeria, Niger, Tanzania, Ethiopia, and Egypt; the dates recorded against the discoveries in these regions differ as well as the extent of their exploration. But what is of importance from this ethnographic finding is the fact that indigenous knowledge had attained an appreciable level of sophistication before the colonial interjection in Africa as ironworking technology has been used to make artistic works in various metallic mediums. This type of technical knowledge which entails the smelting of metals, coppers and precious stones is to be consolidated and assembled as aspects of metal production and use in Africa which is a very crucial aspect of the application on indigenous scientific knowledge.

The other step towards the re-discovery of AIK should be to emphasize the environmentalist discourse on the significance of indigenous knowledge. It may be necessary to consider the ethnoecologists or environmentalist conception of knowledge. As it is used by ethnoecologists, the word knowledge[1] is generally applied to discussions of indigenous understandings of the natural world: systems of classification, how various societies cognize or interpret natural processes, what such groups know about the resources they exploit, and so forth (Brosius1997). This environmentalist conception of knowledge, which is very crucial to the notion of science as it is held in the Western culture, has a rich heritage in AIK. This is evident in the way Africans represent and apply their various understandings of nature or natural processes to life. A good example of this environmentalist representation of indigenous knowledge is the Ijala-chanting among the Yoruba people of Nigeria. According to Babalola (1967:3), Ijala-chanting is a genre of spoken art practised mainly by the y Yoruba of Western Nigeria. It is mythically and ritually associated with the worship of Ogun; is performed at well-defined ritual and social occasions by trained specialists (onijala); and has a characteristic range of subject matter.

It is with this subject matter of Ijala that we are primarily concerned here; it is consonant with the type of occasion at which these chants are performed. The subject matter of Ijala[2] consists of a kind of scientific understanding of nature because it includes chants that describe animals like the elephant, bush fowl, domestic fowl, duiker, etc., and particular crops and plants. For instance, the Ijala chants about a tree, a shrub, a herb, or a crop are collections of remarks about its significant features and its uses. The point we are trying to make here is that the Ijala is a veritable source of indigenous knowledge about nature because it is required that before a string of ideas about things are formalized into chants, there must be a comprehensive understanding of the phenomena about which the chant is to be formulated. It is this accumulated knowledge derived from the empirical investigation of nature that is subsequently woven into and interpreted and exposed through the Ijala chant. The virtue in this line of reasoning lies in the fact that all forms of knowledge first exist as social phenomena before being systematized as a form of procedural knowledge.

In his work titled "History of Science" Herrington (2003:385) further buttresses this point when he affirms that science is a systematised positive knowledge, or what has been taken as such at different ages and in different places. But it should also be noted that the oral practice of Ijala-chanting poses a problem of preservation and emendation via cross-generational rendition; this raises doubts on the scientific content of its formal structures. Much as this issue is contentious, it does not actually negate the idea that the Ijala chants contains verbal assertions about the natural world. The onijala who is an embodiment of indigenous knowledge can be likened to the Western environmental scientist who has knowledge of plants and animals. It is partly from this premise that we maintain that African indigenous knowledge is not in any way inferior to the Western alternatives.

Meanwhile, Paulin Hountondji's quest in Endogenous Knowledge is to argue that it is not the case that Africans are not capable of evolving scientific knowledge, but the problem lies in the fact that whatever element of scientific knowledge can be identified within the African cultural context is not only seen through Western spectacles but used in the service of

1. There are now different approaches to the study of indigenous knowledge, but that of Brush (1993) seems consistent with our work. He holds that there are four distinct, historically-situated approaches that can be discerned in the discourse of indigenous knowledge. These are: descriptive historical particularism, cultural ecology, cognitive anthropology and human ecology. Each of these presupposes a different set of starting assumptions regarding the nature of indigenous knowledge. See. Brush, S. 1993, "Indigenous knowledge".
2. The Ijala which exists in an oral format has some legendary and mythic colouration; so it does not mean that everything about it is true or derived from nature. However, there are different occasions like the annual celebration of Ogun festival, final funeral obsequies for a hunter, festival in honour of lineage ancestors, and the annual conference of all hunter chiefs of Yoruba land.

the West. This is why he asserts that African indigenous knowledge is "extroverted" and it is this extroversion that has created the gap or what we refer to here as the "knowledge war" between AIK and WSK. The popular belief is that the production of knowledge in Africa that is non-extraverted will help to integrate the Third World into the process of knowledge. But we are of the view that this step alone will not do the magic as it has hastily accepted the Western stereotype that classified AIK as "unscientific". There is a need to realize that the way science has been defined in contemporary times precludes the social context of knowledge which is why those aspects of indigenous knowledge that qualify as science were rejected as being "traditional" or "products of primitive mentality". Thus, the important position advocated in this paper is that both the efforts at producing knowledge in Africa and re-discovering elements of scientific knowledge in Africa should be harnessed towards meeting the challenges posed by Western scientific knowledge through dialogue and a promotion of the culture of inquiry over the culture of belief. The demand that dialogue of cultures of knowledge must evaluate its presupposed epistemological framework arises due to the fact that the invocation of dialogue itself presupposes a difference (Okeja 2010). The differences between these two cultural epistemic systems may be in terms of method or in the degree to which certain knowledge traditions have had the chance to develop a robust science. Thus, the stringent criteria for any knowledge to be considered as scientific, paradigms patterned after Western methods of scientific investigation, like experimentation, observation, theory formation, etc. do not hold.

Conclusion

As we conclude, it should be stated that the issue at stake here is not about how human beings across various cultural lines acquire knowledge – it is whether African indigenous knowledge is radically different from the Western equivalent, a situation which depicts the struggle for knowledge. However, we have referred to this trend as a false dichotomy because it is a fall-out of the Western denigration and marginalization that has continued to question the epistemological and scientific basis of African indigenous knowledge. However, the logic of marginalization, as developed through centuries of forced integration, including the slave trade, colonization and neo-colonization, in Africa has not succeeded in blowing out our age-old heritage of knowledge, both practical and theoretical. If this had been the case, we should no longer have any handicraft, any weaving, any pottery and basket-making, any cooking, any metallurgy, any rain-making technique, any traditional medicine and pharmacopeia, any divination system, any botanical and zoological taxonomy or any teaching methods or procedures for the transfer of such skills – which are all evidence of the existence of scientific knowledge in Africa.

Thus two urgent steps need to be taken in order to dispel this false notion that regards AIK as being scientifically inferior to WSK. They are: ensuring the massive development of scientific knowledge in Africa and re-discovering possibly forgotten or lost knowledge in Africa. African people, as well as their political leaders, had simply forgotten that they themselves had developed, for thousand years before colonization, a strong and wealthy iron industry. The iron industry included not only secondary metallurgy, consisting of transformation of the metal as blacksmiths do, but also primary metallurgy, or the extraction of iron from ore (Hountondji 1995:7). As we have argued, the efforts in this respect should be complementary rather than disintegrating. Let it be known that there is no basis for the dichotomy between these two cultural epistemic frameworks, because every epistemology is a product of a culture just as every philosophy is a product of an age, or the cultural expressions of a people. From our explication thus far, it is obvious that both the African and Western cultural epistemological systems share some similar features. A possible charge that may be brought against the position advanced in this essay is that of relativism. But this challenge is surmountable – as we do not see indigenous knowledge as an enclosed system that is disconnected from the social context; rather what we are saying essentially is that this dual approach to the portrayal of indigenous knowledge should serve as the basis for dialogue with other cultural epistemologies in an ever changing world.

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