

ADDIS ABABA UNIVERSITY
SCHOOL OF GRADUATE STUDIES
DEPARTMENT OF PHILOSOPHY

AFRICAN SYSTEMS OF THOUGHT AND SCIENTIFIC KNOWLEDGE

BY
ADERAJEW ALEM
ADVISOR
SETARGEW KENAW (PhD)

NOVEMBER, 2016

ADDIS ABABA

ADDIS ABABA UNIVERSITY

SCHOOL OF GRADUATE STUDIES

DEPARTMENT OF PHILOSOPHY

AFRICAN SYSTEMS OF THOUGHT AND SCIENTIFIC KNOWLEDGE

BY

ADERAJEW ALEM

ADVISOR

SETARGEW KENAW (PhD)

**A THESIS SUBMITTED TO THE SCHOOL OF GRADUATE STUDIES OF ADDIS
ABABA UNIVERSITY IN PARTIAL FULFILMENT OF THE REQUIREMENT FOR
THE DEGREE OF MASTERS OF ARTS IN PHILOSOPHY**

NOVEMBER,

ADDIS ABABA

ADDIS ABABA UNIVERSITY

SCHOOL OF GRADUATE STUDIES

DEPARTMENT OF PHILOSOPHY

AFRICAN SYSTEMS OF THOUGHT AND SCIENTIFIC KNOWLEDGE

BY

ADERAJEW ALEM

ADVISOR

SETARGEW KENAW (PhD)

APPROVED BY THE BOARD OF EXAMINERS

_____	_____	_____
ADVISOR	DATE	SIGNATURE
_____	_____	_____
EXAMINER	DATE	SIGNATURE
_____	_____	_____
EXAMINER	DATE	SIGNATURE

NOVEMBER, 2016

ADDIS ABABA

TABLE OF CONTENT

Content	Page
Acknowledgements.....	i
Abstract.....	ii
Definition of terms.....	iii
Chapter one: Introduction.....	1
1.1. Theoretical Context.....	1
1.2. Conceptual Framework.....	9
1.3. Research Question.....	10
1.4. Organization of the Thesis.....	11
Chapter Two: The Essence of Scientific Knowledge.....	12
2.1. What Sort of Knowledge is Scientific Knowledge?.....	12
2.2. How African Cultures Give Rise to Scientific Knowledge?.....	15
2.3. How Some African Philosophers or Scholars view African Systems of Thought.....	21
Chapter Three: Whether African Systems of Thought Fit Scientific Knowledge.....	30
3.1. The Nature of African Systems of Thought.....	30
3.2. The Difference between African Religions and Other Systems of Thought.....	40
3.3. Relations between Culture and Scientific Knowledge.....	44
Chapter Four: Critical Analysis of Western Characterization of African Systems of Thought.....	49
4.1. The Impact of Western Education on African Cultures.....	50
4.2. Western Academic Racism and How it Undermined African Efforts.....	54

4.3. The Scientific Method and Its Authoritarianism over other Forms of Knowledge.....	59
Chapter Five: Conclusion.....	61
References.....	71

Acknowledgements

First of all, I would like to render my deepest gratitude to my instructor and advisor Dr. Setargew Kenaw for his comments, suggestions and other important inputs to my thesis. It is inevitable for me to express my indebtedness to him because without his comments and suggestions, it is true that my thesis would have not been finished. I also would like to give my thanks to instructors of the department as a whole for the courses that they delivered and from which I have developed the insight about my thesis. I would also like to say thanks to my family that is always in a position of supporting and inspiring me to achieve my goals in my life. It is also inevitable that I want to extend my respect and gratitude to my friend, Mesewaet who invaluablely helped me by providing encouraging comments. I want to acknowledge Mr. Nigussie Wubet, for his help in editing the grammatical aspect of the thesis; my colleague Melisew Lulie has also helped me in editing the paper. I would like to extend my thanks also to Senait, for her kindness and collaboration during my stay here in Addis Ababa and her service of photocopying my materials. I have not forgotten also to thank my staff members and colleagues at Wollo University.

Abstract

The thesis explores the nature of African systems of thought and their relation with scientific knowledge. These thought systems can be manifested in different practices in Africa. Some of them are religious and spiritual, others are also magico-religious and most others are scientific practices. By each one of these practices, Africans since antiquity are being supported and lead their lives. We can see, like medical practices of traditional African healers among other notable practices. But despite this fact, many scholars and thinkers both abroad and inside Africa have no inspiring and positive views about the meaningful efforts of Africans in areas of science and also philosophy. But I found that Africa does not deserve at least this derogatory labeling for all thought systems as mere superstition and magic, because it is the granary of different important scientific practices that have equal and sometimes better validity than the Western modern scientific practices in some areas like medicine. Therefore, this leads us to the idea that African efforts for science and technology is left aside and instead the spiritual and magical activities are taken to the center as the major bodies of thought of Africans. So, in this thesis, I argued that there are valid and effective scientific practices both in the Ancient and the present times although there has been many influences from the Western culture and science.

Definition of Terms

Scientific method: It is a way of doing science having the belief that scientific knowledge or inquiry is acquired through rational, systematic, objective and universal approach.

Ethno-Philosophy: It is the collected world view or the cultural outlook of something including belief systems and also philosophy of a certain ethnic group or society.

Four trends of African philosophy: four schools of thought outlined by Dr. Odera Oruka. These are Ethno-philosophy, Philosophic Sagacity, Nationalist Ideological and Professional philosophy.

Witch Craft: It is the art of doing something using different techniques to detect different malignant and bad spirits

Herbal Medicine: A traditional treatment or medication through the use of herbs or different healing plants usually considered to be medical treatment using organic herbs.

Traditional Healer: A traditional medical practitioner who might be also a priest who treats different psychiatric and physical ailments or illnesses.

Superstition: It is an outlook or a belief of associating the phenomena or different events to a certain supreme being.

Chapter one

Introduction

1.1. Theoretical Context

The context that initiated this thesis is my previous exposure to the courses Philosophy of science and African philosophy especially African traditional thought systems in the pre-colonial and post-colonial times. In my encounter with such courses and issues, I have understood that in African traditions there are different knowledge and thought systems especially in the pre-colonial era that are believed to be Africa's indigenous knowledge which were not influenced by Western science and culture. But after the coming of Europeans to Africa, Western science and culture left aside these typical African thought systems; and in their place what has been esteemed and valued is Western science which is one part of Western culture. The domination of Western science and culture over African cultures is caused by many reasons.

Scholars and philosophers at different times presented different conceptions regarding the African thought systems whether they are philosophical, scientific or any other type. But unfortunately, most of these scholars have the position that African systems of thought are considered to be lacking an element of scientific knowledge that is believed to be based on reasoning and reflection. These thinkers are mostly pro-Western philosophers. This group of scholars includes some Africans and most Westerners. Their reason for this argument is that African systems of thought lack scientific content because African thought systems are mostly based on unsystematic, mystical and superstitious aspects in their orientation.

Despite the fact that most thinkers argued against the existence of scientific knowledge in African thought systems, there are some thinkers or scholars who argued that African and other non-occidental systems of thought could be seen as parallel practice of scientific and other sorts of knowledge. Among these scholars, we can take the arguments of Robin Horton, Sandra Harding, Paul Feyerabend and some others.

Horton, in his comparison between African traditional thoughts and Western science, argued that African thought systems have some elements that can be compared with Western science. For this reason, he said that Western science is not the only thought system. Because there are

also other thought systems that can be compared to the Western theoretical science. To ascertain this, he raised the issue of African religious and spiritual thought systems (Horton, 1967a).

According to him, modern scholars and writers denied that traditional religious thinking in any sense is theoretical thinking. Horton's idea of African thought systems is an attempt of comparison using only religious and spiritual parts or aspects of African thoughts than empirical scientific practices. Of course, he tried to associate the spiritual with scientific practices. But it seems that it is not important for an Africans to tell them that they have a theoretical knowledge comparable with the modern Western science referring spiritual ways of doing things. The comparison would rather be between modern science and African traditional science although they are systematically surpassed by modern science. Horton valued spiritual parts of African thought systems although it should not be exclusively the spiritual that could be considered. For example concerning medication he stated that:

to find out what kind of stress producing disturbances are in particular traditional society, the modern doctor can probably do no better than start by taking notes of the diagnosis produced by a traditional religious healer working in a society. That means, the modern doctor sometimes may take traditional causes seriously enough to take them to test (Horton, 1967a, p.56).

Here, what Horton wants to say is that modern science can sometimes be complemented by even the traditional thought systems. But, practices that can complement Western science are not only the spiritual or the religious part of African thought system.

He further argued that religious thought is no more or less interested in the natural causes of things than is the theoretical thought of the sciences. Traditional religious theory does more than suggesting causal connections that bring no relation to experience (Horton, 1967a). Therefore, the main point of Horton's position is that although modern science is one surest and most efficient tool for arriving at beliefs that are successful, but there are also other experiences that can help us arriving at such beliefs. But as I noted earlier, religious beliefs are not comparable with modern scientific practices for the reason that they are about abstract and non descriptive things.

According to Barry Hallen, Oruka has the view that goes against the claim of ethno-philosophy which says that African philosophy is the collective conception or collective world view of people in Africa. He thought that there are rather individuals in a society who are outstanding in their thinking of different sorts (Cited in. Hallen, 2002). In response to ethno-philosophy, Oruka has said the following:

The activity of reflection up on certain themes of fundamental importance to human life, the existence of a supreme being , the nature of time, the nature of freedom, the nature of death, the nature of education, etc has always been a concern to selected number of people in all societies. This kind of thinking does not presuppose a modern education and even literacy. So, it is false to presuppose that it can only take place in societies that are typed as developed (Quoted in. Hallen, 2002, p.52).

Oruka noted that there were sages not only in traditional Africa, but also in Greece, such as Socrates, Heraclitus and so on. But the difference is that the Western sages are regarded as philosophers, but the Africans are not. This according to him is a kind of Eurocentric bias.

Brown Lee argued also that if true philosophy is really a philosophy which is written and systematic, we could not call Socrates, Buddha and some others as philosophers because none of these thinkers wrote what they taught for people (Lee, 2004). To this end he said, "... that which is sagacious does not simply emerge without critical inquiry and significant reflection" (p. vi). He also seems to argue that the term *traditional* should not be confused with the term *primitive*. Traditional does not mean backward rather it is to mean something which is free from external influence.

So, here, we can understand that the idea of primitiveness is given to African societies that live by their own traditions, philosophies and other thought systems. Since there are medical practitioners, metallurgy workers and sages who are critical thinkers in the traditional sense, it is enough to claim that African traditions are rich source of scientific knowledge. For this, we can see the arguments of different thinkers.

Scholars who believe in the existence of scientific knowledge in different cultures of the world include people like Paul Feyerabend, Sandra Harding and so on (Feyerabend, 1993, Harding, 2008). When we look Feyerabend's claim for scientific knowledge, it is based on a pluralistic

stance. Feyerabend believes that science should not have a unanimous or a singular path and it must be protected from the rule of rationality (Feyerabend, 1993).

His idea is supported by Sandra Harding's claim to scientific knowledge. She is known in her critical analysis of the North Atlantic science and its claim of being the only source of scientific knowledge (Cited in Eze, 1997). She says that science should look for other possibilities and belief systems in different cultures. Because such claims stifle the exchange of thoughts and scientific experiences in different cultures.

For Feyerabend, what we call science should be viewed as one possible way of truth, but not the only one, i.e, scientific success cannot be explained in a simple way (Feyerabend, 1993). He put the case in the following way:

To say that 'the procedures you used are nonscientific, therefore we cannot trust your results and we cannot give you money for research assumes that science is unsuccessful and that it is successful because it uses uniform procedure'. This is not true because even when scientists use similar methods, they experience failure. Therefore, scientists are like architects who build buildings of different sizes and shapes and who can be judged only after the event. It may stand up; it may fall down; nobody knows (Feyerabend, 1993, p.1).

From this we can infer that science which belonged to only a certain group cannot be considered as exclusive and the only way of truth. Science certainly can be found from different sources and cultures without being confined and bounded by certain systems and paradigms. So in this sense, Western science is one among many possible sciences. In this circumstance we can say that African systems of thought, if not as a wholesale, are sciences that can be a parallel practice with what we call science in a general sense of the term.

Following this, we will see the case of thinkers who have strongly challenged the very existence and the possibility of scientific knowledge in African cultures. First, as I have mentioned the case of Ethno philosophy so far, in Africa, there is an impression, that there can be no philosophy or certain individual efforts like some Western ancient philosophers. Ethno philosophy assumes simply as there is the philosophy of certain group of people. Therefore, African systems of

thought are depicted as placing minimal emphasis upon the rigorous argument and criticism that are the pre-conditions for truth (Hallen, 2002).

The other objectionable position of ethno-philosophy is its claim that African's way of life and thinking is not detached from a sort of unanimity regarding beliefs and values. So, this ethno-philosophy claims that Africans are communal not only in their living conditions but also in their thinking.

Against this, Oruka thought that it is a false popularization because in any culture of the African people, there are individual thinkers and critics. He argued that even though Africans have the life of togetherness, there are also individual thinkers. Individual curiosity and thinking is not the exclusive quality of Europeans (Cited in. Hammigna, 2000).

Therefore, the claim of ethno philosophy is one impediment for the African systems of thought to be equally considered as scientific.

The other challenge of African thought systems is racism. Emanuel Chukwudi Eze tried to evaluate the racism of some European thinkers like Levy Bruhl, Emmanuel Kant, George Hegel and David Hume. For instance, according to Eze, Kant has classified the human race into four categories, i.e. the white, the red, the black and the Native Americans. Kant's assumption is that the thinking and reasoning substance of mankind is determined by Geography and Anthropology (Cited in. Eze, 1997). Moreover, he believed that the Negroes of Africa is not educable; they are made to be trained simply as servants. More notably, he devalued the black race saying "black is the negation of white" (p. 117). So, Kant's general conclusion is that "the only race not only educable but capable of progress in the educational process of the arts and the sciences is the white Europeans" (ibid, p. 117).

But, as I discussed earlier, this type of attribution of science to the West is challenged by Harding. For instance, she claimed that any science is ethno science. i.e. science is found in different cultures of the world; even according to her, the North Atlantic science which thinks itself as mainstream science is an ethno science. What gives rise to it is culture and every ethno science carries its own societal and cultural orientation (Cited in. Binsbergen, 2003).

Her argument is that other forms of knowledge should not be overlooked by the Western science. And most notably she believes that we should follow post-colonial scientific approach than the Eurocentrists having the fact that Eurocentricism is not important to know our values or to boost our own scientific and technological practices in different cultures. She argues thus:

I have already indicated that in contrast to the exceptionalist who thinks that this term must be reserved only for modern Western inquiries, I shall follow the lead of post-colonial science studies scholars who use it to refer to any and every culture's institutions and systematic empirical and theoretical practices of coming to understand how the world around us works. Yet this expanded use of the term is controversial for still other reasons. The original producers of what has come to be called indigenous knowledge and traditional environmental knowledge do not refer to their activities as science. So one could regard the instance here on doing so as another piece Euro centrism; if we are to talk seriously the achievements of another culture, we have to talk about it in our terms, rather than theirs, yet it can be valuable to do so in this case because such a practice levels the playing field by refusing to grant Western practices an entirely different, more highly valued category of human inquiry (Harding, 2008, p.16).

So Harding is highly critical about the Eurocentric conception of science and scientific practice.

As it is argued in Simon Mapadimeng's paper, Kwame Gyekye has argued different issues about the nature of African thought systems and scientific knowledge. He argued that the African systems of thought in most cases are incompatible with the truly scientific knowledge. The reason for his claim is that the African systems of thought are strongly influenced by religious and spiritual views than empirical practices (Cited in. Mapadimeng, 2009).

These religious views and thinking are, according to him, "impediments of the African thought systems to be scientific knowledge" (Quoted in. Mapadimeng, 2009, p.3). For instance, he raised the issue of causality, the issue of traditional healers (the traditional medicine men and women). He believes that Africans, to explain the causality of a certain natural phenomena, simply appeal to spiritual and superstitious or mystical things than a certain empirical and objectively verifiable things (ibid).

So, in this case there is no systematic science which is based on analysis and verification in African knowledge systems because knowledge in Africa, in addition to its appeal to superstitious things, the empirical one is based on secrecy than rigorous experimentation.

Gyekye also challenged the cultural revivalists' claim that says "the key to effectively solve existing and contemporary problems of Africa lies in the reclaiming and revitalizing of previous indigenous traditions that have eventually been degraded and suppressed in the wakes of colonialism" (Quoted in. Ciaffa, 2008, p. 121).

Gyekye accepted the argument that colonialism has violently disrupted African cultures and traditions and imposed some sort of European system of thought up on Africans. But, his reservation is that that inherently African thought systems lack the ability to come out of problems of spiritual and religious conceptions. But, he has not denied the potential of African traditional thought systems to be important inputs for the development of science and technology.

Even though Gyekye said the above, there were also thinkers who argue that there were some thoughts in Africa that could be vital for scientific development before the invasion of Africa by the Europeans who came to Africa with 'civilizing mission' which is a pretext and false. Because "the distinction between 'civilized' and 'primitive' mentalities helped the Europeans rationalize colonialism" (Ciaffa, 2008, p.124). They could not assume a scientific knowledge in other cultures of the world. Let us see for instance what Bruhl thought; according to him, "the civilized mentality is regulated by reason and interacts with the world through a carefully organized scheme" (Quoted in. Ciaffa, 2008, p. 24). In contrast, the primitive mentality is believed to be "hardly capable of rational thoughts and is regulated by the forces of myth and superstition (ibid, p. 124).".

What this argument or discourse shows us is that Africans were considered as devoid of even some sorts of important indigenous knowledge systems who simply wait the Western man to baptize them through his scientific knowledge.

According to Ciaffa, contrary to the view of Bruhl, it is better to see the view of a Belgian missionary before colonialism that was Placid Tempels. He had tried to develop a counter argument to Bruhl and others stating that "the so called primitive mind was considerably more

sophisticated than had been suggested by Levy Bruhl” (ibid, p.124). Because, according to Tempels, “Bantu philosophy is constituted by a comprehensive philosophy of life”(ibid, p. 125). Therefore, we can say that, although Tempel’s motive is believed to have a colonial ambition his view about the Bantu is not like Bruhl.

This man is thought to be studying only a small tribe which is found in the Bantu people and argued as if it was all about the Bantu thinking and philosophy. Of course, it is the characteristics of the European missionaries and anthropologists of the time to distort the very essence of African thought systems having unrepresentative data of the people and the culture.

As I tried to show previously, Gyekye argued that although African systems of thought lack scientific systematicity, it has a potential to be grown into rigorous science. But, the current situation of African thought systems do not fit to be called science for him. In a nutshell, there is a very wide gap between Western science and African thought systems. He argues that although traditional cultures of Africa build up many valuable technologies related to herbal remedies, food preservation and so on, they did not have a profound scientific understanding of nature. This according to him is because true scientific inquiry involves systematic observation disciplined by experimentation and the quest for explanatory theories regarding the causes of natural phenomena. He argued, for instance that, in the West the causes of disease just involve a certain inquiry effectively, but in the case of traditional Africa, the causes are really associated with spirits and religious beliefs, .i.e. in Africa, the effectiveness of traditional medicine or herbal remedies was attributed to the intervention of spirits (Cited in. Mapadimeng, 2009).

In any case, the intention of Gyekye is to show that scientific development in Africa requires a significant restriction on the scope and the role of traditional religious beliefs. But this distancing of the African people from their indigenous culture is questionable for the reason that pre-colonial African knowledge or thought system is a genuine manifestation of the Africans.

Here, restriction upon the traditional religious practices may help to practice scientific knowledge which can be independent of the spiritual agencies which are difficult to reason out how it works, but the spiritual and magical practices are also working in the African systems of thought. So, there should be a parallel place for these working and improvable things because they can be essential to solve at least African local problems.

1.2. Conceptual Framework

I have tried to go through Horton's view of traditional African thoughts and Western science. He tried to point out important aspects of especially African religion and spiritual thought systems. He states that Western anthropologists and scientists are mistaken when they argue that their science is based on theory, simplicity, regularity as well as elegance. Because for him, the African traditional cosmologies are also based on certain schemes and they are not as such complex, irregular and haphazard in their nature (Horton, 1967a).

He is of course considered to be one of the anthropologists of the Western world. And many suspected him as he is trying to compare the absolutely incomparable things of the Western modern science and African thought systems only in their spiritual manifestation. He strongly objected the claim that traditional African thoughts explain the causes of things in terms of supernatural than natural. He said that Africans have different means to solve either natural or societal problems. Horton's argument is that traditional thought is not a science, but both traditional thought and modern scientific knowledge have their own contribution (Horton, 1967a).

Although Horton might have some other motives like other anthropologists, his argument which shows the wrongness of Western science's claim as the only problem solving practice is plausible to me; because although it is difficult to deny the great contribution and advancement of Western science today, there are many valuable scientific and other practices that can complement and enhance modern science in African thought systems.

Horton's discussion of all such points has helped me to focus at a certain point as my topic, which is, an African System of Thought and Scientific Knowledge. As I have said, Horton's argument was in support of African traditional thoughts because he thought they are also theoretical like Western science. Therefore, it has served me as a starting point to my thesis although the destination will be significantly different.

His work is the comparison between Western science and African thoughts manifested by religion and spiritual thinking rather than other empirical scientific practices of African science. But, my analysis is between scientific knowledge and African systems of thought in different

aspects. The thesis also intended to argue against Western science's claim that it is the only true knowledge system and in turn to reveal some important aspects of African experiences.

1.3. Research Question

When we think of scientific knowledge, what comes first into our mind is Western modern and advanced science. This is because Western science has developed dominance over other forms of knowledge systems; the technological innovations, the medical and pharmacological activities are advanced and almost unparalleled by other parts of the world. Even though Western science undoubtedly has a meaningful development or progress and is solving different human problems, its development is through overlooking or ignoring other possibilities that can be considered or taken as valuable alternatives to Western science to solve different problems. These valuable alternative knowledge systems are found in different cultures of the world including the Third World like Africa and others. In Africa there are many valuable knowledge systems both scientific and other forms of practices despite the fact that they are not thought as relevant for development of scientific inquiry.

Many scholars in Africa as well as in the Western world have raised different ideas concerning the issue and the nature of scientific knowledge and the African traditional thought systems. However, in relation to the issue at hand, these scholars have no a commonly agreed point. Some of them contend that the causes that African and other non-Western traditional thought systems remain unrecognized are just Western science's claim that it is the only form of genuine thought or science that all the rest of the world should adhere to (Feyerabend, 1993). And some others contend that African thought systems have their own problems to be called scientific and systematic because of its so called mystical, superstitious and spiritual nature.

It is true that European or Western philosophers as well as scientists underestimate or undervalue the African systems of thought arguing that African systems of thought are not scientific and progressive. Because many scholars and thinkers argue that the measure of scientific knowledge is only Western science. The question that I tried to answer is therefore, which African systems of thought can be taken as scientific knowledge and how can they be considered as scientific thoughts or knowledge systems?

So, pointing out some efforts of African societies for scientific knowledge as well as changing some of such wrong conceptions of the meaning of scientific knowledge in relation to African thought systems is my task in this study.

1.4. Organization of the Study

The thesis is organized into five chapters. The first chapter is an introduction which comprises the theoretical context, the conceptual framework, the research question and the organization of the thesis. The second chapter explores the essence of scientific knowledge. Under this, I will explore the following issues: What sort of knowledge is scientific knowledge? How African cultures give rise to scientific knowledge and how do Some African philosophers or scholars view African systems of thought? The third chapter is about whether African thought systems fit scientific knowledge Under this, I will discuss the following issues: The nature of African systems of thought, the difference between African religion and other systems of thought, and relations between African culture and scientific practice. The fourth chapter is a reflection on Western characterization of African thought systems. Under this, I will raise issues like the impact of Western education on African cultures and Western academic racism (how it undermined African efforts), and the scientific method and its authoritarianism over other forms of knowledge. Finally, the fifth chapter is about the conclusion of my thesis.

Chapter Two

The Essence of Scientific Knowledge

2.1. What Sort of Knowledge is a Scientific Knowledge?

A scientific knowledge is a sort of knowledge which is thought to be different from other forms of knowledge. Science is believed to have a unique character. For instance, according to Ayala, there are three traits that distinguish scientific knowledge from other forms of knowledge:

First, science seeks the systematic organization of knowledge about the world. Second, science strives to explain why observed events do in fact occur. A third characteristic of science, and the one that distinguishes the empirical sciences from other systematic forms of knowledge, is that scientific explanations must be formulated in such a way that they can be subjected to empirical testing (Ayala, 1994, p. 207).

But, it is the way that Western science is defined. Thus it is better to view the essence of scientific knowledge from the point of view of the Western mainstream conception which is known to be formal and systematic as I tried to show in the above paragraph; and from the point of view of other scholars who are not adherents of the Western conception of science. The Europeans may develop scientific knowledge through answering certain questions like, what the scientific method is; how do evidence and theory are related and so on. For Westerners, scientific knowledge is believed to be something which is acquired through systematic ways of undertaking experimentation, formulation of theory as well as prediction. This is considered to be the system of scientific knowledge that Western thinkers have developed as a body of knowledge.

But when we see other culture-oriented or non-occidental thinkers, they thought that scientific knowledge is a knowledge which is emanated from the culture and the tradition of the people.

In this case therefore, what we call scientific knowledge is not something which is outside of the culture of the people, i.e. modern scientific knowledge which is organized by universal rules also may not be conceived to be exclusively different although such a system is not found in Africa today.

Although it is true that there is no systematic study, it does not mean that the Africans do not have the concept of scientific knowledge. For instance, one identifying character of scientific knowledge is its ability to act independent of superstition. If this is the object of scientific knowledge, Africans have such a conception of science and thus they can have scientific knowledge. In different cultures humans may gain knowledge by undergoing empirical observation to understand nature. And it will be problematic to simply reduce them to a knowledge that is exclusively based on mere experience as opposed to theoretical knowledge. There may of course be a high need of reason or evidence for a certain belief to be true. For instance, Alvin Goldman has argued that scientific knowledge is based on justified true belief about the world (Cited in. Resnik, 1998).

Here, the thought of Goldman is that the work of scientists is to identify the true belief or hypothesis from the false one so as to form knowledge which is workable to different circumstances. This knowledge is not based on mere assertion about things, but through posing rigorous justification.

Paulin Hountondji has also tried to define scientific knowledge in his argument that African needs science first than a philosophy. Scientific knowledge he says“will get us away from “metaphysical problems,” “the meaning of life, “and problems of “human destiny “and “the existence of God.” (Quoted in. Bell, 2002, p. 30).

It means that unlike metaphysics which is about thoughts or questions that cannot be adequately explained or answered; scientific knowledge is based on a certain set of solutions for different problems. So here, we can see that scientific knowledge is the way of thinking and knowing about natural phenomena of the world through different mechanisms.

Paul Thagard also stated that:

To represent scientific knowledge, we need to find a formal expression for at least three kinds of information: observations, laws, and theories. Philosophers of science have differed on the relative importance of these aspects in the development of scientific knowledge. On one simple account of how science develops, scientists start by making experimental observations, and then use these to generate laws and theories (Thagard, 1993, p. 12).

This, as I have noted earlier, has not a welcoming effect to different thinkers. For instance, scientific knowledge, for Harding, has a different perspective. It is also different for Feyerabend. For Harding, scientific knowledge is not the science that claims hegemonic power over other possibilities of such knowledge (Eze, 1997). Science is not completely detached from the beliefs of the society; rather it carries its own societal and cultural orientation and meets nature's challenges. She believes that valid knowledge systems or scientific knowledge is found in different cultures that Western science has disregarded their validity. To ascertain this, she noted:

.....because every ethno-science is to meet the challenges of a more or less unique local variation of nature's possibilities, and because every ethno-science carries its own societal and cultural orientation, it is quite probable that in other ethno-sciences than North Atlantic science forms of knowledge about nature are stored which are not only valid, but which have not yet been recognized by North Atlantic science and which therefore are to form a valuable addition to North Atlantic science. (Quoted in. Binsbergen, 2003, pp. 4-5).

When Harding posed an objection to North Atlantic science, argued that “despite all its successes in describing, understanding and technologically controlling the world, also contemporary North Atlantic science may thus see itself be reduced to the status of an ethno-science” (Quoted in. Binsbergen, 2003, p. 7). This is because Western science is considered to be emanated from a certain ethnic and cultural background.

Feyerabend also noted that we cannot have one definition of scientific knowledge; we can have many different kinds of sciences. People from different social backgrounds approach the world in different ways and learn different things about it. He said, “People live a millennium before the coming into stage of Western science; during those times they had different knowledge including astronomy and other sciences” (Feyerabend, 1993, p.3).

So, for Feyerabend, Western science has arisen certain years ago and brought other forms of sciences to the lower stage and in its place, it has developed and imposed Western culture and way of life. Further, it claims that when one tries to define scientific knowledge, it has to be in line with Western science. This for him is nothing more than preventing other cultures from being the source of knowledge.

Feyerabend's counter argument for Western science is I think appropriate, i.e. if Western science's claim is right, and then there would not be profound scientific achievements in other parts of the world long before the coming in to being of western science. The success of Western science is its domination of different cultures of the world during colonialism. Especially, European domination over the land of Africa has resulted in overall decline and deterioration.

We can say that the Western claim of centering their own science is not because their science is inherently different and special from the experience of other cultures, but because of their arbitrary claim of dominance which has a devastating effect over others. So, the meaning of scientific knowledge is set only for Western science because we could not find a scientific meaning for African thought systems. They are once regarded as traditional and mystical.

2.2. How African Cultures Give Rise to Scientific Knowledge?

Is there a scientific knowledge in African cultures? I think it is an important question that should be addressed to argue that some African thought systems are endowed with scientific practice.

As I have tried to discuss in chapter one, some 'group' of the scholars have a position that African traditions and cultures lack a scientific content for the reason that they have no systematic orientation. But, the other group has the stand that African cultures like other cultures in the world have a sort of scientific content that could be used as a complementary resource for what we call science.

Hallen argued that epistemologically and metaphysically, African culture is very hospitable or welcoming to scientific inquiry. We can have examples or instances for this claim. To take a few, we can see the Akan of Ghana, the Yoruba of Nigeria, the Ndembu of Central Africa and some others. Although African cultures are regarded as the adherents of supernatural causes than natural causes, it is not found to be true in the case of the culture of the Akans of Ghana (Hallen, 2002).

This is because the Akan conception is basically relied on empirical outlooks. So, if it is related to scientific outlook, therefore, lack of empirical observation is not the overall manifestation of Africans.

The Akan thought is believed to be empirical than transcendental in its nature. It is obvious that when we say something is empirical, the conception is true if it is believed to be familiar only with things that exists in time and space. And it is transcendental if its units or objects are understood to exist somewhere outside space and time¹.

It has been understood that the Akan conceptual structure is unwelcoming to things that are not straightforwardly or indirectly open to the empirical undersanding. In Akan culture, there is a sort of a concept of order. The Akans say that “before everything, order comes; without order, you have no cosmos; and without the cosmos, there is nothing knowable to be known and no knower to know it. So, with cosmos, there are things knowable and the knower to know”¹(n.d, p.6).

The Akan thought system in this case, is open to scientific inquiry. So, when we think of African cultures like the Akan and others, it gives us the impression that the argument that African cultures all in all are short of observational knowledge is wrong. According to Hallen and Wiredu:

The Akans are known to have had a measure of technology which while not spectacular, was still not inconsiderable. For the purpose of war, they devised the usable weapons; and for the purpose of peace, some artifacts to please themselves and others useful in various ways. They also had iron and steel enterprises. Steel and iron implements have been discovered and sites of some foundries have been unearthed. They had precious metal ornaments and their artistry and skill in the treatment of gold and jewelry impressed the early European visitors¹ (n.d, p.7).

All these accomplishments and efforts are accompanied by a good deal of observation and some sort of experimentations.

¹Barry Hallen & Kwasi Wiredu: Science and African Culture. Paper 1. Science and Akan Culture. (n.d). See from page 3-7.

They also noted that spiritistic views were prevailed in both European culture and Africa. But, in the the case of Europeans, science is on the way to reduce or eliminating their spiritistic outlooks. But the case in Africa is a bit wider. But, the point is that this does not effectively prove that there is no scientific knowledge in traditional African cultures.

Horton tells us that he has seen Victor Turner's project which is made in the Ndembu people of central Africa which is about the diagnosis of disease. He argued that:

A Ndembu diviner not only refers to unseen spiritual forces, but also relates the patient's condition to a whole series of disturbances or illness in his or her social fields. The Ndembu traditional healer or diviner believes that a patient will not get better until all the disturbances or the tensions or the aggressions in the group's interrelations have been brought to light and expose to ritual treatment. The diviner or the traditional doctor uses ideas about the agency to link the disease to causes in the world of visible and tangible events (Horton, 1967a, p. 54, emphasis added).

Therefore, it seems that it is difficult to conclude that the traditional African diviner does his medication by referring only to magical and spiritual forces for there is also an attempt to associate the religious and the observable.

Horton (1967a) also added that "mental health problem or mental stress is the cause of illness and exacerbates disease in both the Western modern and industrial society and African traditional society" (p.56). But, the effectiveness of diagnosing and curing is held by the traditional African healers than the Western modern psychiatry. To this end, "modern psychiatry is becoming highly culture oriented or culture based" (ibid).

This is not the only thing according to Horton. He said that there are also traditional causes of explanation of mysterious bodily diseases (ailments) that modern doctors found to be difficult to cure, but finally completely cleaned by traditional religious healers (ibid).

Something related to this point is also argued by Sogolo and Sertima. Mapadimeng stated;

"Sogolo's view that the traditional African medical conception of illnesses is different from that in the Western medical practices but common in approach, and that the primary and secondary

accounts are complementary and non-mutually exclusive, is shared by Sertima” (Quoted in. Mapadimeng, 2009, p. 15).

Sertima following this argued that “the African medical practice is characterized by knowledge of plant science antiseptics vaccination and advanced surgical techniques; it however has but elements of ritual and magic” (ibid). Here is what Sertima argued:

The traditional African doctor is often an expert psychotherapist, achieving results with his patients that conventional Western psychotherapy cannot “and that” the use of suggestion , hypothesis and placebo in addition to internal and external treatment is becoming more and more appreciated in Western medicine (ibid).

Having all this as it is, we should also see the indigenous metal work technology experience of some Sub-Saharan countries and people. Metal work represents the vital technological account for Sub Saharan African people. The smelting practice is undertaken in different metals. This technology has three separate and consecutive procedures. As Shadreck Chirikure, Rob Burrett & Robert B. Heimann noted “the first is mining or collecting, the second is concentrating and cleaning the ore and the third one is smelting to produce the metal and something to manufacture objects” (Chirikure *et al*, 2009, p. 196).

Such things are done for example, effectively according to Chirikure and others, in Mandara plain of northern Cameroon and other areas. “This people (Cameroons) studied the mafa iron smelting technology” (ibid, p. 197). Mafa smelters are believed to produce a cast iron and low carbon steel that was consequently decarburized in vessels or smelting plate (ibid). This type of technology is practiced not only in Cameroon, but also in many parts of Sub Saharan African countries.

From such views then, we can understand that cultures in Africa have their own ways of doing things in a scientific way. It is evident, as noted in chapter one for instance, in the case of medication and psychotherapy in African traditional healers. African healers even sometimes do what is impossible in Western modern medicine. If this is so, then what is the basic ground to label African thought systems as traditional and they could not fit scientific knowledge? This is a vivid problem.

Here again, it is better to see Harding and others' view that apart from the North Atlantic science, other cultures of the world are repositories of valid knowledge systems. Like what Feyerabend stated, she also said that the success of North Atlantic science is nothing, but its colonization and domination of other cultures in the name of its claim of rationality, objectivity and universality that according to her, Western science does not deserve (Binsbergen, 2003).

So, according to her, other culture's knowledge systems can be valuable additions to the North Atlantic science. That is, North Atlantic science should not claim as if it is the first science, rather it should know that it is one part amongst many sources. Feyerabend seems to have similar position with Harding in arguing that:

it is true that Western science now reigns supreme all over the world, but the reason was not because of its inherent rationality, but power play. It is also true that Western medicine helped eradicate parasites and some infectious diseases, but this doesn't show that Western science is the only tradition that has good things to offer and that other forms of inquiry are without any merit what so ever. First world science is one among many (Feyerabend, 1993, p. 3).

Although Feyerabend argues in such a way, he said that he didn't object to the wonderful inventions of things in the world by Western science. But as he said, he is "against the ideologies that use the name of science for cultural murder" (ibid, p. 4).

For him, proliferation or alternative of theories are important to science, while uniformity impedes its critical power. Uniformity also threatens the free development of individuals, i.e. if science is believed to be successful; it is not because it uses uniform procedure. This uniformity as it is not the only means of scientific progress is proved, according to Feyerabend, by China for instance. He argued that Chinese technology for a long point in time had no any Western scientific support, but it was better than contemporary Western technology and innovation (Feyerabend, 1993, p. 3).

Theophilus Okere, in his article; "Is there one Science, Western Science?" argued that it is not deniable that Western science has contributed a lot for the current development of science. There is an overwhelming contribution of the West to science. But according to him, it would be absurd to think that this overwhelming dominance amounted to a monopoly or to marginalize the

contribution of other civilizations or other branches of the human family to the development of science (Okere, 2005).

His view here is like that of Feyrabend's argument that science is pluralistic which does not have only one center. I think their claim is feasible. Because as Feyerabend and Okere said, we are sure to talk or to argue that Western science provides us with multiplicity of technological benefits. Things or innovations are becoming unbridled. This is the indication of the supreme attainment of Western science. But, the problem comes when we consider Western science in a way that reduce all possibilities of scientific knowledge to the West.

But, despite the fact that many thinkers and scholars have argued that African cultures can be meaningful additions to Western science or repositories of valid knowledge systems, there are also other thinkers who objected the presence of such knowledge in African people and cultures. Having our obvious knowledge that many Western thinkers have no positive views for African efforts to do science and philosophy as it is, there are African scholars who believe that there is no science and scientific knowledge in Africa. Among others, Peter Bodunrin is the leading one in the circle.

Hountondji, although he has not denied the presence of traditional pre-colonial African scientific and other knowledge, has a critical attitude towards the indigenous heritage of Africans. He argued that "Africans must make a "clean break" with the pre modern past in order to address the most urgent demands of the present" (Quoted in. Ciaffa, 2008, p. 122).

For him, unless this is done, the most urgent problems of the present will not be addressed. This idea is also shared by Gyekye. He thought that African traditional thoughts are highly inclined to mysticism and superstition and this made them not to be self critical and so on (Cited in Mapadimeng, 2009). The details will be discussed in section 2.3.

So, for these scholars, the African systems of thought, since they are highly dependent on spiritual and religious beliefs than the empirical ones, are incompatible with modern scientific knowledge. But both of these scholars have the belief that African cultures have potentials to develop scientific knowledge if they refrain from different traditional constraints. Therefore, in this point, it is not true if we label Gyekye just like the Western critics because what is not good to him is the way Africans approach science and philosophy.

Following the argument of Gyekye and others, Peter Amato, who has a multicultural or intercultural intellectual approach further dismisses the view that “religious inspired ideas and accounts of social reality are necessarily regressive” (Quoted in. Mapadimeng, 2009, p. 11). So Amato’s view has the impression that religious and other traditional social practices could not be conceived as impediments to philosophical and scientific developments.

From all these, we can understand that African systems of thought with their rectifiable problems are sources of scientific knowledge if not in the most advanced form of scientific knowledge. As there are different mystical, spiritual and other conceptions, there are also meaningful empirical scientific practices in Africa.

2.3. How Some African Philosophers or Scholars view African Systems of Thought

So as to have a clear understanding of African thought systems, it is better to see the philosophical views of some scholars. Regarding this issue, it seems that there are two categories of scholars in Africa. One group comprises scholars who thought that African systems of thought have relevant philosophical and scientific worth and the other group consists of scholars who thought that philosophy is universal and it is not important to concentrate on the traditional and cultural thought systems that could not meet the universal. This category of thinkers represents universalists. The former category of thinkers among others consists of Hountondji (in some circumstances), Sertima, Wiredu, Okere and others. The latter group consists notably, Bodunrin.

As we know, there are many slanders about Africa and the way of thinking of the people. These slanders are mostly from Western thinkers and scholars. The obvious slander is that Africans are devoid of philosophical and scientific practices and knowledge. Africans are most of the time considered to have contributed nothing worthwhile to the development of science and technology. There are really different misconceptions about Africa. I will not go to the broad detail of these problematic views of the scholars of Europe under this section, because I will present Western misconceptions in chapter four. Here, I am trying to point out some African scholars views about the African systems of thought. The ‘first group’ of African scholars or philosophers thought that Africans in pre-colonial times have developed their own scientific experiences. Among these one is Van Sertima who explained in detail about the scientific and technological experiences of ancient African societies (Cited in. Chinweizu, 2010).

The 'second group' also comprises other African philosophers and scholars who believe that there is no philosophy and scientific knowledge peculiar to Africa or generally in the tradition of Africa. This category of scholars is adherents of the foreign or Western conception of philosophy and scientific knowledge. They thought that, there is simply universal philosophy which transcends any cultural and other traditional contingencies. This is because these thinkers or philosophers are the so called professional and universalistic philosophers (of course not all professional philosophers do argue in such a way). So, these philosophers denied the existence of philosophy in African traditions and thought systems.

As I mentioned so far, the first category of philosophers or Hountondji and others believe that Africa is not really devoid of scientific and philosophical thought or knowledge. But according to them, even though Africans have valuable source of knowledge systems, these knowledge source are highly affected by Western colonialism. For this reason, according to them Africans today are doing Western borrowed philosophy and science which is well developed and advanced.

This category of scholars believes that it is becoming difficult to make those traditional and indigenous African knowledge systems to cop up with the Western science. Because Western science left aside such African valuable knowledge sources as simply ethno-philosophy and folk science that do not fit the mainstream science.

I believe also that since different cultures are endowed with certain knowledge systems, African societies are not devoid of their own scientific and philosophical practices. For example, we can see the ancient African societies' contribution to science and other practices as Sertima briefly pointed out. Referring to archeological evidences, he figured out some major works done by African societies like medicine, metallurgy, astronomy, mathematics, agriculture, navigation, architecture and engineering. According to Sertima:

The African we have been dealing with, the African we've been focusing upon, or rather the African that our Eurocentric vision has created, is one-sided and false. The African we were taught to envision as the true African is the peripheral creature of the forest zone or the colonized survivor of the slave trade. The more sophisticated centers of Africa were shattered; the great achievements of mainstream Africans were ignored. So we have a comparison between the mainstream European and the

primitive African. Even people of African descent have come to the conclusion that what is special about the African is his simple, raw humanity, his exotic little rituals and costumes, etc. They are not aware, for example, of his scientific tradition. Most people have been made to think that it was the European, because of his so-called theoretical and abstract thinking, who alone learned to master and transcend nature. When we go back in history, we begin to realize that this is not true (Quoted in. Chinweizu, 2010, p. 4).

He is presenting us the fact that African people and their civilization is disregarded and falsely formulated. By magnifying their own scientific and other technological contributions, they told Africans that they contributed nothing in science. According to him, Africans themselves, because of this wrong formulation, also believed that they were really primitive. The Africans distorted conception of themselves is nothing, but what they have obtained from Europeans which is false. I think Sertima is right in dealing with making the Africans to be conscious of their misconceptions about their scientific and technological history. Another thing which we obtain from Hountondji and others is the issue of anthropology; let us see what Sertima argued concerning it:

Anthropology has had a long love affair with the primitive and has preferred to set its tent down among the African bushmen, exploring the simplicities of tiny tribal communities rather than the complexities to be found in the primary centers of large African nations. Very partial and limited visions of the African hovering on the fringes of his vast world have come to represent the totality of his capacity and potential. . . . What they mean by traditional is the only kind of culture we have come to accept as African—that of the primitive on the periphery, the stunned survivor . . . Even notable African scholars, in their romantic embrace of this exotic savage, have come to the conclusion that the African invented nothing, explored nothing, but occupied some special sensory or emotional realm in his experience of the natural world (Quoted in. Chinweizu, 2010, pp. 5-6).

So, as Sertima noted in the above quotation, some African scholars do not want to see themselves arguing Africans have done or contributed something like science, philosophy

and other more things to the world. Among these scholars we can see Bodunrin. He argued that:

philosophy is a professional and theoretical discipline like physics and mathematics, with universal application and character, and with a well-known methodology, and like the aforementioned disciplines is universal- there is a way of writing, teaching and doing philosophy all over the world. (Quoted in. Azenabor, 2009, p. 72).

He thought that philosophy in its orientation is basically culture neutral or culture transcendent or there is no philosophy which is belonged to a certain culture or a certain society (ibid). As Rober E. Bert said “Bodunrin apparently identifies himself with the professional school of African philosophy” (Bert, 1991, p. 96).

Since he identifies himself also as a universalist philosopher, he tries to point out the problem of African philosophy by referring to the differences between the so called four trends of African philosophy by Oruka. He seems arguing that each category or trends answer the question of African philosophy differently. This for him is one of the reasons that African philosophy is problematic (ibid).

As Bert notes, Bodunrin claims that Ethno-philosophers consider African philosophy as a sort of communal thought and practice rather than a body of logically analyzed ideas of individual persons. He also argues that ethno-philosophy is rejected by the so called professional philosophy. Most professional philosophers are assumed to have the position that the folklore, myths and traditional worldviews of Africa cannot be amounted to philosophy (ibid). In a nutshell, he said that “Philosophy must have the same meaning in all cultures, though often with differences of emphasis and focus” (Quoted in. Bert, 1991, p. 97).

He also argued that despite philosophical sagacity’s attempt to point out the presence of individual sages who philosophizes in Africa, the existence of African philosophy is not hitherto verified by the traditional thinkers, because traditional thinkers are not literate adequately to build up a critical philosophical thought. It is true that Bodunrin believes that genuine philosophy is a written philosophy, i.e, literacy is indispensable for philosophizing.

Here what is radical in his argument is that genuine philosophy is a philosophy which is done by literate and educated men. From this, we can possibly infer that Bodunrin’s position in African

systems of thought and scientific knowledge may be similar to his position in African philosophy because as there is no, according to him, African philosophy, it is unthinkable to expect him to argue that there is a sort of scientific knowledge in African philosophy. He has once associated himself with the Western methods of doing philosophy, his attitude to the African way of knowing is highly skeptical. In being the adherent of a Western mode of philosophizing and knowing, his position is that there is no any other experience of philosophy in different areas of the world.

If this is so, since African societies in the traditional sense are not literate, it leads us to conclude that there is no any attempt of philosophy and other important practices. This, I think is problematic, because more or less different world views are sprang inside the society. And if literacy is really necessary for philosophizing, how did the philosophy that we are dealing today come in to being?

For this argument, there is something in Okere's article that I am going to directly quote. It seems a counter argument to the 'second group' of philosophers. He writes:

In this connection we have mentioned the ancient civilizations of Egypt and Mesopotamia, and of India and China as cradles of science. Many other contemporary, non-Western cultures have written records of their knowledge traditions. But, what of the many, cultural traditions that have preserved no written records? What of the poor, illiterate sub-Saharan Africans? Should their knowledge traditions, if they exist at all, be taken seriously? We know what a barrier mass illiteracy has created for these civilizations. But if we grant that written records help immensely in preserving and handing over knowledge, we know also that, of themselves, they do not create knowledge. Formal education is also a great advantage, but living traditions of informal education have their own advantage. If we grant also that the degree of 'scientificness' will always be debatable and, even when settled, will still be variable, there is no doubt that these peoples do have their own science or bodies of knowledge. For one thing, a science like medicine will have to be taken for granted as a genuine science native to every culture in history (Okere, 2005, p. 29).

So, any culture is endowed with a sort of knowledge either scientific or any other form. Scientific knowledge exists in different societies although the degree of being scientific is different or subject to debate by scholars. Illiterate societies may have knowledge of different sorts that are equally vital with more advanced knowledge systems. We may, for instance, raise the issue of medical practices of different societies. These medicines that are produced by traditional societies are sometimes found to be more efficient in curing diseases and relieving pain than the Western one.

Unlike Bodunrin, who is among the philosophers who argue that there is no philosophy in different African traditions, African philosophers in the first group claims rather that, although colonialism has destructed many African sources of knowledge, a good way of doing philosophy is a synthesis of from our African traditional philosophies with that we can bring from modern knowledge sources. For example, Wiredu in his article: “Conceptual decolonization as an imperative in contemporary African philosophy” (2002) has stated that the words or the language that are used to explain things are foreign languages. But, our African linguistic concepts can also explain things effectively. So, he has the stand that Africans should decolonize their philosophy especially the terms and concepts employed in English languages to explain Africa. For him, “colonialism has caused a widespread involuntary intermixing of Western and African intellectual categories in the thinking of contemporary Africans” (Wiredu, 2002, p. 54). In this intermixing, the African languages and concepts are dominated (ibid).

However, according to him, it is not worthy to argue that what comes all from Africa is necessarily true, genuine and so on. What is wrong is the undesirable overestimation of Western approach of thinking. Because for him, this overvaluation of Western knowledge shows that there is colonial mentality in the thinking of Africans (ibid). For him, disapproval or complete avoidance of all foreign sources of knowledge is not good rather, a sort of synthesis from the West and African indigenous knowledge sources is important (ibid).

From this, we can infer that African cultures are the repository of different knowledge systems that should be used in collaboration with the Western systems of knowledge. For this group of philosophers, Africans have gone far from their cultural resources of philosophical or scientific knowledge. Wiredu to this end said that “Intellectually we are brought up in Western style educational institutions” (Wiredu, 2002, p. 55).

The knowledge we have in philosophy or scientific knowledge is what comes from the Western intellectual resources. This tendency according to them may hamper the Africans from finding their own way of doing philosophy and science.

They more or less agree in the argument that in Africa traditional knowledge is still marginalized. In addition, these philosophers believe that Western depiction of African knowledge systems is not right or is not rational. Because the belief of Western scholars that African culture of togetherness and some sharing of collective characteristics is taken as what is all about African philosophy, is not rationally formulated.

It is true that the collective way of life of the people is considered by the Europeans as what is typically African philosophy. These philosophers' reaction to define African philosophy in such a sense is that it brings a certain problem for African philosophy because if African philosophy is merely reduced to collective thinking, it will possibly lead them to conclude that there is no philosophical enterprise in Africa.

To strengthen this idea it is better to add the case of Bruhl's racist claim presented by W, J. Ndaba in his article: "The Challenge of African philosophy: A Reply to Mabogo More." As I have noted earlier, the major attack on African systems of thought has come from Bruhl. He was not of course a philosopher, but an anthropologist or an ethnographer. He has strived to point out differences of race and thereby conclude the inability of other races to reason and know things scientifically. To generalize in such a way, he has mainly focused on factors, like culture, race, which is contingent and concluded that Africans are devoid of philosophy and science (Ndaba, 2010).

Here, the mission of Western ethnography is to superficially observe a certain culture in Africa and see a sort of unanimity, then to identify it with African philosophy, which is too narrow and unfair.

There is an overestimation and embracing of unanimity in the study of anthropology. Anthropology wrongly considers African cultures as cultures in which one agrees with the other without critical consideration and study of things. This assumption seems uncomfortable to Hountondji and others. Unanimity defined in such a way is I think a refined form of one of the major sins of anthropology. The conception of unanimity sounds also as the over simplification of non-Western cultures and favoring Western culture. Hountondji has criticized the task and the study of anthropology that as far as it is concerned, it should have to promote pluralistic approach when it studies different

cultures. It would consist in acknowledging the fact of diversity of opinion and belief in different human society and it should have to value diversity indication of cultural wealth or health and as a sign of creativity that may exist outside of the Western culture (Wiredu, 2004).

Like Hountondji, Sertima intended to argue that taking some societies of Africa or even one single community and concluding the case that the African way of thinking is this (unanimous) is not acceptable (Cited in Chiweizu, 2010). So in this case, they tried to show the flaw of anthropology.

I think they are right in pointing out the problems of anthropology. Western anthropology should explicate other possibilities in African cultures rather than excluding some important culture as a source of scientific and other systems of knowledge. This undesirable and hasty generalization of African thinking as unanimous is subject to many criticisms. To see this in detail, let me quote Hountondji:

In the course of that developed in and outside Africa about ethno philosophy, I came to qualify my critique of unanimity. I acknowledged clearly that any human group could live on a set of assumptions shared by its all members, whether or not this set of assumptions is systematic enough to be considered, as it often is, as a “system of thought.” I still rejected, however, the hasty way in which ethnologists and some philosophers tended to label such sets of assumptions as “philosophies.” To me, these assumptions represented instead the initial material in relation to which philosophy could develop as a critical, personal; body of thought (Quoted in, Wiredu, 2004, p. 131).

I think the critique of ethno-philosophers’ view of African systems of thought is rightly pointed out by those philosophers because every human society has its own way of living; way of knowing things and way of approaching reality and nature. Some of these assumptions may be shared by all members of the society, but this can hardly be considered philosophy. These are rather the way of life of the people or cultural manifestations that could only be seen as a cultural essence than a philosophy. The culture which is simply taken as unanimous may have a philosophical enterprise and philosophical individual thinkers. But the Western anthropologists and ethnologists have overlooked such possibilities. This is their ambitiousness to center philosophy and science to their Western culture than thinking of such things anywhere else in Africa.

Hountondji comes to argue broadly about scientific knowledge in Africa with his article titled: "Scientific Dependence in Africa today" He argued that resulted from colonialism, there is high dependency of science in Africa. For him, true science is not being practiced in Africa today not because of the natural lack of ability to do so, but because of lack of good training. African scholars do nothing to add something new to the field of science for the reason that they are not trained in their own systems of thought or because they are simply seekers of Western training to do science. So, there is a structural limitation of scientific and technological activity in Africa today. He thought that what we call science is externally oriented like our economic activity in which we are consumers of foreign goods (Hountondji, 1990).

Although he said the above, he has admitted that he is not diminishing the existence of pre-colonial African knowledge. Generally, Hountondji argues:

I do not in any way mean to diminish the importance of pre-colonial knowledge and "know-how." On the contrary, I believe that the whole matter is really about the fate of this pre-colonial heritage, its real place and status in the context of so-called modern science. It is about the way that pre-colonial knowledge has been set aside, marginalized, deprived of its internal dynamism and power of self-regeneration and self-criticism, prevented from absorbing, assimilating and freely developing contributions from outside for its own benefit. It is about the way that pre-colonial knowledge has been reduced to silent, dumb juxtaposition with imported forms of knowledge which in the long term assures its decline and death (Hountondji, 1990, p. 7).

It is of course true that today, there is no such thing as African science and technology, because of the colonial legacy that has threatened almost all of the nations of Africa. But, here, we should not forget the fact that our non-Western knowledge systems sometimes fit even today's more advanced science. For example, if we take typical African techniques or ways of healing patients of different diseases, their validity is equally valuable with the Western science. There might be a problem of training in African scholars. But, it is possible even today to explicate the scientific experience of Africa from the place where it is masked by the Western colonizers. This can be effective only if African scientists and anthropologists turn their face basically to their continent rather than seeking only a Western occidental training.

So, the first group of philosophers' argument is credible. Because there is African philosophy and scientific practice embedded in the culture of the society. Also, the conception of unanimity is too much exaggerated by the Western anthropologists and ethnologists. Unanimity in Africa is manifested in their day to day interaction and relations, it does not mean that Africans think cooperatively, reason communally and speculate collectively. There are critical thinkers in their cultures like, philosophic sages, who are thought to be even critical about their own cultures (Aznabor, 2009). And there are also traditionally trained healers, metal workers and astronomers in different cultures of Africa. These all are what we can possibly conceive as scientific practices, even though Western scholars regarded these all as primitive and not based on rigorous reason.

Chapter Three

Whether African Systems of Thought Fit Scientific Knowledge

3.1. The Nature of African Systems of Thought

It is argued that Africans possess a thought system which is embedded in their cultures. And the way of life of the society is thought to be communal. i.e. if there is something particular to the African way of life, it is their communal way of life which we do not most of the time find in the Western world. That is why the famous African scholar Cheikh Anta Diop argued that black Africa as one of the domain of the world in which people are the impoverished who today possess the least from all other continents, but it is the only continent where destitution does not prevail in despite this poverty because of this harmony (Diop, 1989).

This does not mean that all African people have necessarily similar culture, but the point is that, although cultures in Africa vary from one another, the way of life is through mutual understanding and belongingness as well as brotherhood rather than affirming a sort of individualistic life which is common in Western nations.

When I say this, it should be noted that I do not hastily conclude that the Africans way of life is all about their overall thought systems and philosophy, regardless of the Westerners interpretation. It means that their communal way of life may contribute in one way or another to their thought systems. Many African philosophers and scholars believe in the communal nature of the life of African people. Having this in mind, they are observed when they pose important questions like what is the relevance of indigenous African traditional thought to the challenges of contemporary life? Do the traditional modes of thought constitute resources or impediments to the project of development in Africa? And other more questions.

When we see for instance, Gyekye and Hountondji, they believe that there is really an African way of thinking or an African thought system and also scientific practice, but their major worry is that, whether these African thought systems and knowledge are able to solve current issues and problems that African people face.

Their worry springs from the fact that Africa is becoming the greatest consumer of Western scientific and technological products that are in some way alien to some African problems. These

alien technologies do not manifest African conditions. So, for them, to argue that there are typical African thought systems, there must be a system that inspects and tests the applicability of African thought systems on African problems.

Similar observation is held by Bekele Gutema in his article (2007), titled: “Extraversion and the Goal of Education in the African Context that”;

.....The African countries with few exceptions have largely remained dependent on the North. This dependence robbed them of the means and confidence to think independently. We committed an original sin when we started to believe that development in a different situation could be helpful as our model, too. This is not to undermine the importance of Western science and technology to African countries. I refer to the weakness of African countries (universities) in indigenizing knowledge produced elsewhere to address African problem. In fact this act made the educational undertaking (teaching and research) in the African case largely superfluous since we limited ourselves to serving only as Southern outposts of the metropolitan Universities and research institute. Instead of trying to understand our problems and formulating proper questions with regard to the problems, we kept in believing that somebody else has already done the thinking and it is only sufficient for us if we could copy from that (p. 111).

African thought systems are highly intertwined. The philosophy, science, religion or spiritual and cultural things are sometimes supportive each other. Some thought systems can be taken as philosophy; others also are scientific, religious and cultural as well.

Oruka’s conception of philosophic sage seems to go against the claim of Horton, who has drawn distinctions between the African traditional cultures and Western scientific cultures, referring to the former as “closed” cultures and the latter as “open” cultures. By “closed” cultures or thought systems, he refers to those cultures in which there is no developed awareness of alternatives to the existing and established theories or beliefs whereas the “open” cultures are those that have a highly developed awareness of different alternatives (Horton, 1967b).

Horton is arguing that “an obstacle to progress within the African traditional cultures lies in their reluctance to question the established beliefs owing to the fear that any threat to those beliefs could result in a horrific chaos (Quoted in. Mapadimeng, 2009, p. 4).

Here, Horton’s argument is that the key of the overwhelming development of Western culture or science is because it is self-critical and open for different possibilities and alternatives, and the means of African thought systems to be still unchanged is because it is not self critical and did not find different options (ibid).

But, as I have noted earlier, Oruka believes in the presence of self criticism and reflection in African cultures. This testifies that Horton’s wholesale labeling of African cultures as “closed” for different reflections and alternatives, is not well supported.

On the other hand, African system of thought can be viewed as having scientific manifestation. Under this, it will be better to see cases of African traditional medicine and healing mechanisms, it is also important to see ancient African technologies and significant scientific knowledge because that ancient technological knowledge may have been given rise for some technological developments of today.

Let us see first, African medicine and methods of healing: Traditional herbal medicines, generally thought to be naturally happening plant-derived stuff with smallest or no manufacturing processing that have been used to treat disease within local or regional healing practices [Cravotto et al, 2010] (Cited in, Oloyede, 2010).

African traditional medicine is the set of knowledge and practice which is used in diagnosis, prevention and elimination of physical, mental and spiritual or social problems. The traditional healer in Africa in most cases develops his activities by identifying two levels of treatment. i.e. physical and the spiritual levels. Carrera said “Traditional healer - as an expert on the feelings, beliefs and the dominant norms of conduct, norms of the community to which the patient belongs tries first to establish the “spiritual” cause of the ailment” (Carrera, 2010, p. 3). “Listening to the sick person or to his/her relatives, using divinatory techniques and putting himself in contact with the spirits of the ancestors, he will decide on what has broken the equilibrium of the person or the group and which evil forces are causing the sickness” (ibid, p. 3).

This is considered to be the spiritual level of treatment. This way of treating diseases is labeled as a sort of mystery and witchcraft by the Westerners. In spite of the avoidance of the African traditional healers by Western thinkers, African traditional medicine maintains a strong connection between curing and spirituality, because the people of the continent live extremely the psycho-religious values of the humans. Immediately after the main causes of the ailments are known or diagnosed and treated, the customary practitioners pass to get rid of the corporeal sorts of the sickness. Traditional medicine men to offer effective and inexpensive medication for the major diseases upset the people of the continent like malaria, abdominal illness, respiratory troubles, arthritis, sexual problems, anemia, parasite infections, mental problems, bone breakage and so on. This is what is known as the physical level of treatment (ibid).

It is believed that great majority of the people of Africa seek advice from customary experts on traditional medicine that are herbalists and others for their sickness to be treated. Following the success of traditional medicine to treat different complex causes of illness, many individuals prefer the traditional modes of treatment.

From this also, one may deduce that the approach of medication and treatment and the nature of conception of illness is different between Europe and Africa. The treatment is most of the time done by religious men and priests in Africa. This makes the separation between religion and scientific and medical practice in Africa a bit difficult.

It has been noted that traditional African medication or healing has a holistic approach unlike the Western one for disease is conceived as spiritual or social disorder and physical illness.

It is also believed to be true that Egyptians were well known in gynecology and surgery. As Helaine Selin, who wrote a lot about Ancient African contribution for science and technology, broadly argues, the ancient Egyptians were responsible for many medical innovations. In addition to developing herbal tradition and methods of clinical therapy, they also produced a code of medical ethics that lets the physicians to give treatment to the people (Selin, 1993a).

Similarly, Daniel A. Offiong stated that, African traditional healers have been variously referred to as herbalists or native doctors (native healers). The role of witchdoctors is thought to be to detect bad spirits. Customary healers are often the main source from which a large part of African population obtain their healthcare, especially since healing is far more than the

curing of certain illnesses (Offiong, 1999). So, besides healing and curing diseases of different kinds, traditional medicine men do many things in their practice.

Ancient Africans and other societies were specialists of different skills. We can see Selin, who noted that Ancient Africans had their own methods of birth control which controls birth. In this regard, Egyptians were believed to use “plants and herbs for contraception whose validity and applicability has been even proven by modern medicine.” (Selin, 1993a, p. 41).

And it is true that, by many scholars Egyptians were not considered as proper Africans, but there are also many evidences that logically show they were black Africans (James, 2009).

It has also been explained by for instance, Diop and others that Egyptians who contributed a lot to the world were blacks. Therefore, if they were black Africans, then their heritage in different medical and other scientific practices really belong to Africa.

There are evidences that Egyptians were the first to practice surgery. Although many of them used surgery for ornamental purpose, some others used surgical techniques for medical purposes like bone setting and so on. Selin also noted that:

Egyptians were among the beginners in practicing circumcision of men. “it was a ritual performed by priests probably on large groups of adolescents or young men (but not infants). Firstly, circumcision has been undergone by only royalty, nobility and priests, but latter, it became an obligation to undergo circumcision. For all pubertal males, perhaps it is a pre-condition of mirage, but it may have been optional or even unavailable for some young men. Regardless of the extent to which circumcision was practiced, it seems to have grown out of the priests concern for bodily cleanliness and hence purity (Selin, 1993a, p. 41).

Mercer Cook Who has interpreted Diop’s book: *The African Origin Of Civilization: Myth or Reality*, from French into English also stated that “the Egyptians as well as the Ethiopians have practiced circumcision as early as pre historic times and there are evidence that indicates Egyptians thought this for different Semitic people including the Arabs and the Jews” (Cook, 1974, pp. 135-136).

Throughout Africa, there are, as I have tried to note earlier, many traditional healers than trained medical practitioners. Some argued that during colonial rule, traditional African medicine was

almost eliminated because traditional medical practice is considered by the colonial masters as witchcraft than the science of healing people.

Karen Flint in his book, *Healing Traditions: African Medicine, Cultural Exchange, and Competition in South Africa*; stated that traditional healers, of which there were many types, are specialized according to their talents and areas of excellence. His study for instance, takes us to South African society's medical experience. He thought that "historically, the healers performed a variety of functions for African communities; these include, bringing rain, detecting bad spirits, negotiating with ancestors and using herbs and surgical procedures to mend and cure the body" (Flint, 2008, p. 1.)

Here, when we see the practice of traditional medicine, it was broadly done and practiced in the ancient and past times than today. If we ask why? Flint tells us that although there are effective medicine men and herbalists in many parts of Africa, there was a restriction of practicing such things by the colonizers or the colonial rule (ibid).

It might be also true that African governments are not welcoming this sort of practice. Or at least they are not ready to encourage it.

So, according to Flint, the effort of different medicine men in South Africa made European health practitioners and white masters or government authorities quite uncomfortable. This is because the Europeans know that the traditional medicine is effective in curing many malignant diseases and if this is so, they understood that they cannot sell their modern medicine to the African market. So their best alternative was to restrict the African traditionally effective way of healing as witchcraft and nonsense. To ascertain this, it is better to see Flint's argument directly here:

The rivalry between the white masters' medicine and native South African medicine is essential to note, as it not only upsets conventional notions of traditional African and biomedical medicine, but demonstrates that medicine was yet another arena for larger colonial contest over political and cultural hegemony. The result of this competition influenced the ways in which biomedical and African healers come to conceive of themselves and largely limited healers' legal status under white rule (Flint, 2008, p. 5).

This is not the problem of a particular society in Africa. Because there are many societies in Africa in which the Western medical practitioners and government have influenced the very essence of traditional medicine. To elucidate this, it is better to see the case in Nigeria. Offiong argued “An important problem impeding an effective program of primary health care in Nigeria is the antagonism or hostility directed against practitioners of traditional medicine by the practitioners of Western medicine” (Offiong, 1999, p.126).

Therefore, we can understand that African traditional medicine, although it is as valid as the Western modern medicine, is encountering many challenges of the colonial competition and massive domination. In this case, colonial masters have contributed a lot for the deterioration of valuable African traditional medicine and its practitioners.

When I say that traditional African medicine is as valid as the Western one, it is because there is a sort of diagnosis in both cases that undertake a certain method. For instance, like there is a positive and negative effect of modern medicine, there are also positive and negative effects in traditional medicine. Let me take the idea of Mbiti, a Kenyan priest:

Purging witches and detecting sorcerers is a function for traditional healers. Certainly traditional healers identify witches and sorcerers but this is primarily in the process of determining the cause of sickness in order to determine the cure. Of importance is the fact that a traditional healer may be a witch (white or black).¹ Certainly all traditional healers know a lot about sorcery. It is very much like a physician who knows the positive and negative aspects of medicine - the very drugs that are used to save life can be used to destroy it (Quoted in. Offiong, 1999, p. 125).

After all, we have seen that African traditional medicine is one among the thought systems of Africa as a scientific contribution. We have taken it as an African thought system because such practices are typically African society’s efforts as a scientific heritage. These things also prove the fact that Africans do really have their own medical science which is different in the method of treatment from the Western modern counterpart (which is based mainly on physical treatment).

As I said, African thought systems are multi-faceted. The thought systems can also be manifested in metallurgy because smelters produce iron and these iron materials can be produced according to the purpose that they have in the community and the production of iron or metals in Africa need high technological effort.

Louise Iles is a Research Associate at the Department of Archaeology, at York University. Louise Iles & EdwinusLyaya (2015), argued that:

Metals served a variety of roles within African societies, ranging from the functional and the decorative to the symbolic and the communicative. The process of winning metal from an ore is a difficult procedure, reliant on the procurement of high quality ores, ceramics and fuels and the application of complex technical knowledge. It is a resource-hungry and time-hungry technology that runs a high risk of failure, but when it succeeds it almost miraculously transforms stone into a substance with a new set of material properties. Perhaps for these reasons, rituals and symbolism often accompanied the activities surrounding metal production and metalworking, manifest in the items used to create or manipulate metal (furnaces, medicines, bellows, tuyères and tools) or the songs, movements and behaviours associated with the processes themselves(pp.481-482).

It is thus, possible to assert that metals have provided a great deal for the everyday life of the population of Africa. Therefore, from studying African metallurgy and metalworking, we can understand more about the role of metals in human cultures.

For instance, the following notion of Chirikure, Burrett and Heimann, show us how metallurgical processes are culture based:

Importantly, the purely technical acts were imbued with the non-technical rituals and belief systems. Throughout most of Sub-Saharan Africa, for instance, iron smelting was associated with human gestation and reproduction. This is sometimes demonstrated by the practice of decorating furnaces with female anatomical parts such as molded breasts. Additionally, beliefs in witchcraft were prevalent amongst many smelting communities and medicines were invariably used in metal smelting (copper, tin and iron) to neutralize the powers of inauspicious sorcerers.

Archaeologically and ethnographically, this practice is showcased by the existence of medicine pots strategically placed in either hole underneath smelting furnaces in places such as Cameroon (Quoted in. Chirikure *et al*, 2009, p. 197).

This shows us that, African thought systems can be manifested in the form of medical practice. It can also be manifested in metal work or metallurgical processes. As typical African thought systems, this process needs high technological knowledge, because to produce metal objects and different ornaments, they need to highly heat their different furnaces. As different writers noted, the earliest African furnaces produced profound metal objects for different purposes of their encounter with nature. So, as a thought system, African traditional medicine and metallurgical processes are based on good knowledge of the technology that the time requires. This in turn shows that Africa despite the Western slanders was a continent with different cultures and respective technologies. As we have seen, many of the medical and metallurgical works are obtained before the Western science and technology come into being.

This holistic approach of African system of thought is effective in solving different African problems. But, despite the fact that African thought systems are rich in different problem solving disciplines, it could not escape the Western wholesale criticism and rejection. This Western scholars' position that there is no technological innovation and science in Africa is problematic; because it is undoubtful that they knew the ancient technological advancements of some cultures and societies of Africa, like Egypt and other Sub Saharan African people. And some of the technologies that are applied by such cultures were even before the European civilization. It seems that their denial of even the recognition of African efforts is intentional and keeping their monopolistic appropriation of scientific and technological innovations.

It will be wrong to argue that the scholars have no any knowledge of the African heritage and contribution even for the world, notably by the Egyptians from which probably the civilization that Europeans at least the ancient Greeks highly relied on. I strongly agree with the works of many African scholars such as Diop, Sertima, Hountondji, Chirikure and some others who strongly struggled to change the racial and wrong attitudes of whites towards Africa by pointing out many magnificent works of ancient and modern day Africans in areas of science, medicine, astronomy, metallurgy and mathematics.

Different medical plants or herbs grow on the soil of Africa and there are also effective traditional medicine men or healers. But, both the traditional medicine men and healers are ignored by Western medical practitioners or even Western governmental bodies and at the same time by African governments and scientists.

But, it is not feasible to totally argue that Africans should not learn from the West. There are really many things that Africa should learn from the developed nations, but the problem is that, since the Western culture is developing dominance over other cultures, it does not look for inter communication with other cultures.

So Africa is not the granary of ignorance, rather it is repository of different technologies and scientific practices. These sorts of resources of knowledge need to be uncovered for the rest of the world. And I suggest that traditional African medicine men and individuals with other different skills should be supported and assisted by the respective governments of Africa. And there should also be an experiment for African indigenous sciences so as to be advanced.

3.2. The Difference between African Religion and other Systems of Thought

African religion and other systems of thoughts are believed to be highly intertwined and sometimes other thought systems are permeated in their religion.

They have a strong commitment to the universal reign of law in all spheres of existence. God is not apart from the world. Together with the world, God constitutes the spatio-temporal ‘totality’ of existence. As we saw earlier, the natural-supernatural dichotomy has no place in the African conceptualization of the universe. The thinking is hierarchical, with God at the apex and extra-human beings and forces, humans, the lower animals, vegetation and the inanimate world, in this order, as integral parts of one single totality of existence (Quoted in. Coetzee and Roux (Eds), 2003, p. 198).

As we have seen in the first portion of this chapter, African thought systems are manifested in one way by religion and the other by culture and science. Most of the day to day practices of the people of Africa is believed to be accompanied by different rituals. Sometimes, the influence of religion in cultural and other thought systems is found in different societies across the globe

outside of Africa. Scientists sometimes are also influenced by some extra scientific practices. For example, we may see the case of Newton here:

Newton was strongly influenced in his thought not only by his voluminous researches into biblical apocrypha, but also by the hope that his natural philosophy (or physics) would impress on people the necessity for a divine intelligence to impart to material particles their initial order and motion. He also saw the existence of God as necessary to sustain the notions of absolute space and time (Hear, 1989, p. 131).

There is a divergent view regarding the concept and the philosophy of African traditional religion. For this, some thinkers have seen Africans as if they do not have the capacity to reason on the concept of God. This led them into characterizing or giving all forms of derogatory names to African traditional religions.

This case of the intertwining relationship between religion and secularity in Africa has brought a problem when one tries to understand the thought and reasoning of Africans. Each group of society may have its own traditional religion whose dogma is embedded in terms of the proverbs, the folklores, oral traditions, ethics and moral status of African societies. So, knowing African traditional religion in order to establish how Africans reason and think about the world around them, is an important task. That is why their culture is infuse with religious practices. For this, it is better to take what Mbiti has said about African culture and religion as it is highly integrated. He observed that “religion is permeated into different departments of the life of the Africans” (Quoted in Ekeke, n.d, p. 3). So, it seems that, the deep study of African religion is very important to know the practice of the society. Their religion is the strongest element in their traditional background and religion exerts a great influence on the thinking of the people of Africa. Ekeke argued that “Africans see the universe as created by the Supreme Being” (ibid).

A clear definition of traditional African religion is also provided by some writers like Omosade Awolalu. Here is his definition:

When we speak of African traditional religion we mean the indigenous religion of the Africans. It is the religion that has been handed down from generation to generation by the forbears of the present generation of Africans. It is not a fossil religion (a thing of the past) but a religion that Africans today have made theirs by living it and practicing it. This is a religion that has no written literature,

yet it is “written” everywhere for those who care to see and read. It is largely written in the peoples myths and folktales, in their songs and dances, in their liturgies and shrines and in their proverbs and pithy sayings. It is a religion whose historical founder is neither known nor worshipped; it is a religion that has no zeal for membership drive, yet it offers persistent fascination for Africans, young and old (Quoted, in. Ekeke, n.d, p. 4).

Here, what we can understand is that African religion is a religion which is not derived from anywhere else than Africa itself. The religions have no any founder like the Christians’ Jesus or the Muslims’ Mohammed. It is a religion that the peoples over all asset and knowledge are found in.

African thought systems as religion and as scientific practice may have a sort of difference, although in some instances they are similar. When, we, for instance, see different technological practices of Africa like metallurgy, mathematics, architecture and so on, they are almost scientific practices without being highly dependent on religion. The intervention of religion can be manifested in areas like medical practices, astronomy witchcraft and so on. Therefore, even though there is a difficulty to identify strictly the areas that African religion has not intervened, it is possible still to point out some thought systems that are technology oriented, not religion dependent. But, it is very difficult to have a clear and uncontroversial separation between African religions and other indigenous thought systems, i.e, there is some nuance between the two.

Although many of African traditional thought systems are relevant for the development of Africa, if they are given a due concern, there are some practices and trends that are not to be welcomed, like witchcraft, which some societies use as a weapon to hurt other people who are considered to be their enemies; it has a negative effect. The other thing as I noted earlier, is secrecy, some people who have the skill of curing different malignant diseases and other health problems keep in secret, even die having it within them without sharing it for the rest of the people.

Other than these, different religious activities support different scientific activities like healing and medication. Sometimes when a person becomes sick, he or she will go to the healers. The healers may have different techniques of diagnosis of the person’s illness. It may be with the aid of spirits so as to have a better conception about the disease. So, here, the healer or the medical

practitioner has two kinds of practices; one is when he/she physically treats the patient using different herbal medicines; the other is, when he/she brought spirits for additional understanding of the person's cause of infection. Therefore, this shows that how much religious or spiritual life of the African people and some scientific practices are integrated.

Here, it is better to take the insight of a scholar named, Dickson Nkonge Kagema; in his paper, *The Relationship between Religion and Science in Mission: Reflections from an African Christian Perspective*; Kagema argues that for African people, "God is the origin and sustenance of all things. He is outside and beyond His creation, but He is personally involved in His creation so that it is not outside of Him or His reach" (Kagema, 2014, p. 49).

This means, to the people of Africa, God is the cause of all things. Therefore, religion and scientific practices in Africa are not contradictory since Africans also believe science as it is caused by God. According to Kagema, science is not only a method but a way of life. This implies that, both religion and science are vital components of Africans life.

African religious conception has a difference with that of the West in that, Western Christian religion is believed to be uninvolved in different scientific practices, i.e, the realm of religion and science is different. This might be because of the conception that science advocates a rational conception of things while religion is based on faith. We can find only a few philosophers and scholars who thought that religion and science are not contradictory in the Western world. For instance, we can see Thomas Aquinas, who argued that there could be no contradiction between religion and scientific practices if man knew enough about things because both are originated from God (Cited in. Kagema, 2014).

So, this has the impression that the assumed tension between religion and science is caused by human beings problem or failure to perceive of the God who is thought to be the origin and the source of everything. Above all, it serves as the inspiration and guidance to practice different things.

3.3. Relations between Culture and Scientific Practice

As Catherine A. Odora Hoppers noted:

Culture is commonly understood as the totality of socially transmitted behavior patterns, arts, way of life, beliefs, institutions and all other products of human work

and thought. Culture is also understood as spectrum encompassing the total way of life of a people, the social legacy that the individual acquires from his/her group, a way of thinking, feeling, and believing, a storehouse of pooled learning, a mechanism for the normative regulation of behavior. And it is a set of techniques for adjusting both to the external environment and to other people. It is a precipitate of history, a behavioral map, sieve or matrix. Put simply, it is the everyday; the music you learn, the religion, the festival and the ritual. It is the way people do things (Hoppers, n.d, p. 1, emphasis added).

Culture is also defined by some scholars like, David Millar, Bugu Kendie, Atia Apusigah and Bertus Haverkort as follows:

Culture is defined as the way of life of a people. It is the totality of the human-created world. It comprises the intangible aspects of life – language, beliefs, myths, folktales, proverbs, histories and legend, philosophy, world-view, laws, values, attitudes, social systems, knowledge, religion, rituals, music and dance, technology, games, modes of production etc; and the tangible – buildings, tools, clothing, medicine, food etc and the environment – the flora and fauna etc. of the human habitat. (Millar, *et al*, 2006, p. 54).

Since this section is about scientific Knowledge and African cultures, it is better to see the definition of science. When we see the mainstream definition of science, we have the Oxford Advanced Learner's Dictionary which defines science as:

An organized knowledge, especially obtained by observation and testing of facts about the physical world, natural laws and society. It is the intellectual and practical activity passing the systematic study of the structure and behavior of the physical and natural world through observation and experiment. The scientific method entails the meticulous process of gathering and analyzing data. Scientific knowledge is empirically verified, that is, tested though experiment and observation. In short science is a broad term that refers to any type of knowledge-base that can have some type of predictable outcome. It includes nature, experiments, outer space, and many other things. Science covers a lot of research and is an ongoing mission to discover new things and to understand them (Cited in. Kgema, 2014, p. 47).

These definitions are that we always encounter in different disciplines and areas. But, here, it should be seen in the perspective of the relation between culture and scientific practice in Africa. So, under this, it will be good to address issues like; how can culture and African scientific knowledge go together? And in what circumstances they differ?

To respond to the above issues, it is better to see the claim of different scholars that pointed out the fallibility of Western scholars' argument about the culture neutrality and independent structure of Western science as a background.

When we see, the received view of the relationship between science and African world view, it seems to show us that they are incompatible with each other.

A Nigerian scholar, Isaac Olakanmi Abimbola is arguing that, in spite of the fact that the content of science may be general, the context within which it flourishes differs so that it is possible to have different conception of a similar science in different part of the world. He also added that the Western world view may not be necessarily compatible or incompatible with the African world views or thought systems. The two views (scientific literacy and the African world view) seem as if not mutually exclusive; because science as far as the new philosophers of science is concerned, is a human activity. Such new philosophers of science include Kuhn, Feyerabend and so on (Abimbola, 2009).

So, nobody should have an exclusive scientific literacy. And from this we can possibly take the impression that, Africans can have a scientific literacy if science is a human activity and part of a human culture. Science as a human activity is also argued obviously by Harding. She is known in arguing that every science is a form of local knowledge or cultural knowledge. She argued that after the coming of Western science, it produced the currently established structure of science and she called this "the externalist epistemology." (Cited in. Eze, 1997, p. 47). This science is believed to be the only path of science that everything which does not conform to its principles is not science in real sense.

As Wahlberg, who reviewed Harding's work; Harding Sandra. *Is science multicultural?* Harding has contrasted this with the method of post-colonial science studies which observes interactions among cultures. This post-colonial science studies gives a halt to the European epistemological dream of a perfectly coherent account of all nature's regularities (Wahlberg, 1999).

Her central point is that post-colonial stand point of science as a counter argument poses modern science and technology like other cultures' way of knowing as local knowledge systems.

Here, although there is a high affinity between African culture and African science, there are also some difficulties in considering some traditional thoughts of Africa as science, because there are many things that seem difficult to understand and apply to the real progress of the continent. For instance, we can see the case of dominantly deep religiosity and reliance on spiritual powers and agencies. One cannot equate this with science or because these are not empirically provable and tangible. But, it is also possible to argue that different scientific practices are sometimes initiated by the religion and the culture of the society. So in this regard, to some extent the argument of Horton, Gyekye and some others that some African thought systems are not compatible with the scientific enterprise and are inhibitive to the development of the continent is plausible. So, some African thought systems like believing in spiritual forces and religion by themselves are not believed to develop the spirit of rational inquiry and scientific approach. They can sometimes be effective in healing or other things, but are difficult to compare and contrast with scientific inquiry.

When we raise issues of the relation between scientific activity and culture in Africa, it should be viewed in the sense that each culture traditionally has developed different ways of practicing and making things. This doing or practicing things brought the production of materials that are useful for their encounter with nature. Science also produces materials that enhance the life of people on earth. It is in this circumstance that we take the practice of Africans or African thought systems as equally the practice of science. Their practice of things is also sometimes conditioned by their traditions. For instance, we can see the case of mathematical calculation in some cultures of Africa by Claudia Zaslavsky (1970). She argued that because some numbers are taboo for those cultures, they conceive them differently.

An interesting phenomenon is the compounding of the names of seven, eight or nine; $7=6+1$, $9=8+1$ as among the Mandyakos of the Western Sudan while in the Ga language of Ivory Coast lagoons, $7=6+1$, and $8=6+2$. This phenomenon may have been due to a taboo on speaking a name of certain numbers. Seven was a particular ominous number among the Congo and the Mossi (p. 351).

So, like these mathematical ideas in some cultures, different seemingly scientific practices are culture dependent and hence, a culture gives rise to the development of science. It is true that the root of science is a human curiosity and practice in different cultures. And this curiosity and practice is in one way or another influenced by the way of life of the society. And if we think that scientific practice is culture independent, there would be a special and neutral place for science uninfluenced by culture. One thing that can be taken as an evidence for scientific knowledge to be dependent on culture is the presence of different ways of doing things in different cultures. For example, one group of society or ethnic group may develop a well advanced astronomy associated with their culture's condition or motive; the other group of people may instead be very diligent in metallurgy, wood work different ornaments and architecture or agricultural tools. Each society may excel in different scientific activities in accordance with the interest of their culture.

Abebe Zegeye and Maurice Vambe argues that:

Every culture has the capacity to renew itself through the inventiveness of its people in their unique ecologies and through interaction with other social systems. These scholars said, African knowledge systems are the cultural expressions of the local, that is not only in and of the global, but that is the African globality from which Africa as a subject can authorize views of itself whether or not these views are taken seriously outside of the continent. According to their view, in Western thought and academy, most African thought systems or indigenous knowledge systems were desecrated and pejoratively described as superstition. Simply Africa named the granary or the repository of ignorance and "a dark continent", without its own history, culture and self-defining memories (Zegeye & Vambe, 2006, pp. 331-332, emphasis added).

Different cultures in different areas of the World are the granary of different thought systems including the sciences, the philosophies and other forms of thought. The indigenous knowledge of the society is streamed from the culture of the people. It is this African culture which was treated by a foreign culture. If this culture is influenced and attacked, therefore, it can be counted as a great lose of important human intellectual heritage. Because Western science cannot explain everything successfully by its own or it has limitations when it operates nature. But, if it

gives the chance to other cultures to complement, it would become more successful. There are vital knowledge in different cultures of Africa that attempts to operate the working the natural world around us. African magico-religious beliefs are successful in many areas. So, for Western science, rather than simply regarding African cultures' traditional knowledge merely as magic, it would be better if it gives a functional place for it.

Chapter Four

Critical Analysis of Western Characterization of African Systems of Thought

If all cultures have developed their own forms of knowledge, the spectacular success of a certain form of knowledge, science, notably in the West, has frequently led to its being exclusively attributed to the west. Yet science remains only one of many forms of knowledge and the West only one of its producers. The success of the West has tended to marginalize other forms of knowledge and other contributions to knowledge and, thus to impoverish an otherwise potentially rich and complex world knowledge landscape (Okere, 2005, p. 20).

Under this chapter, I am tending to argue mainly about the merit of African traditional thought systems and the negative impact of Western Scholars' views. As I have explored in the above chapters, African thought systems are rich in different experiences, including scientific, religious, and cultural spheres. Despite this fact, scholars mainly in the Western world have no concern and positive view about these relevant cultures and different knowledge sources that can be taken as one valid and meaningful knowledge sources like that of the modern scientific practice. Even though there are some traditional practices that are not significant for the progress of science and technology, many of the traditional thought systems that are practiced by Africans are found to be vital, if they have given a due concern. The African thought system embodies complex indigenous practices like medicine and healing, witchcraft, technology or metallurgy, astronomy, mathematics, magic and spirits. From all these, Western scholars as well as scientists and philosophers select witchcraft, magic and other things that are not subject to different empirical testing.

Most of the Western philosophers and scholars, without moving and observing African way of life and scientific practices as well as philosophies, they merely regard African thought systems as far from being really scientific and 'formal'. To support their argument, they refer to different anthropological and ethnographic studies that are formulated sometimes falsely without taking into account the presence of many African knowledge systems. Sometimes it seems that Europeans employ anthropologists to denounce and neglect the real manifestation of African people and their knowledge. Because in their study they left aside the important aspects of

traditional African thought systems and focused on the unimportant aspects of different traditional practices. It is, therefore, through this fabrication that the anthropologists portrait Africa and pave the way for colonization through first having a ‘civilizing mission’ by their missionaries. Western science, which is simply taken as genuine science, is conceptualized fundamentally as pure ideas not as the culturally determinate institutions and practices that sociologists, historians and anthropologists report to us.

It is also true that, in many cases, European appropriations of the accomplishments and the efforts of other scientific traditions are not acknowledged at all. Scientific practice is found in many cultures even other than the Western and the Eastern worlds. Long before the emergence and the beginning of European science and technology, there were attempts of different scientific and technological practices in Africa, Asia and other cultures that the Europeans are thought to be borrowed. Generally, in this chapter, I am presenting my position or argument by developing the following issues: the impact of Western education on African cultures, Western academic racism and how it undermined African efforts; finally, the scientific method and its authoritarianism over other forms of knowledge.

4.1. The impact of Western Education on African Culture

One of the factors that resulted African thought systems and cultures to be upset is, the system of Western education. Western education has come to Africa since the time that European missionaries came to the land of Africa. Even though the main agenda that the missionaries came to Africa might be different, they are thought to come to educate the Africans especially, religious education having the assumption that, African people are barbarous and primitive, having no exposure for education before. Soon after the missionaries came to Africa, they encounter a cultural pattern which they could not understand easily, but they label it as something substandard when they compare it with their European cultures. To meet their objective of inducing their own culture to the Africans, they tried to harass anything which is important and belongs to the natives. Leaving the important cultures of Africa aside, they tried “to teach Christianity and influence the people to believe in one God” (UKPABI, 1970, p.164).

This preaching of Christianity in Africa is the first attempt of the coming of Western culture and system of education to Africa. When we see the approach of Western education and African

cultures, it is contrary. In that, the form ascribes the so called rational and scientific explanations to the day to day phenomena, while the latter observes such phenomena in terms of a spiritual stance (ibid).

It is also added that “Africans would not need the Western spiritual education because traditional African societies have social and religious norms which govern the manners of their members” (UKPABI, 1970, P. 165). Therefore, we can say that European religion simply is a pretext for colonization.

African cultures are regarded by the Europeans as deeply endowed with spiritual, superstitious and magical aspects or attributes. But, the Western counterpart is labeled as rational and scientific. This Western system of education which is believed to be rational and scientific has for centuries attempted to avoid the above aspects of African cultures and replace it by their own systems. But, one thing that we should keep in mind is that, despite the attempts to eliminate these African traditions, these traditions are found even in today’s Africa. When we ask why? It is perhaps because they are found to be significant and effective in most cases like that of the Western scientific and rational aspects of explaining things or events.

Education is thought to be the part of all human activities and cultures. So, it is outrageous for one culture to come and claim to educate the other. One culture may come to the other only if there is a need of intercommunication or exchange of experiences. But, the Western tendency is not to communicate and exchange its experiences and ideas. It rather came to Africa to replace the traditions and cultures of the people. That means, Europeans intended to make the Africans students of their thoughts by telling them to abandon what all they had before. It is therefore, right that some African scholars argued that Western education is a miseducation for Africans because it has alienated them from the experience that they had and imposed another foreign experience. In this connection, I would like to quote Chinwoizu in J.B. Gabriel 2014):

It was a miseducation which, under the mystique of “Modernizing” me into some “civilized” condition, had worked to infect me with intellectual meningitis that would twist my cultural spine, and rivet my admiring gaze upon Europe and the West. It was a miseducation which sought to withhold from me the memory of our true African past and to substitute instead an ignorant shame for whatever travesties Europe chose to present as the African past. It was a

miseducation which sought to quarantine me from all influences, ancient as well as contemporary, which did not emanate from, or meet with the imperial approval of, western “civilization.”(p. 179).

This shows that, the Europeans came to Africa not to help Africans, but to distance the African from his indigenous way of life and thought system that he is used to be guided by. It seems a deliberate elimination of what is significant for Africa. Pre-colonial Africa is believed to be rich in its different practices either scientific or others. People used different techniques to win a life in their encounter with nature or natural phenomena. They were producing different iron tools, herbal medicine, agricultural means, architectural technologies and many more things even before Western science, including the Greeks begun to rise (Kagama, 2014).

But, Europeans after they collected or amassed different knowledge from different cultures, including the Eastern world, the Arabs and as well the Africans (Egyptians), they began to be falsely chauvinist of their culture and science, and come to Africa through a fake ‘civilizing mission’ which is just an irony because their objective is to set the grounds for colonization. For their occupation of Africa to be successful, there was a need to eliminate important values and knowledge resources and cultures of African societies. Then, if these treasures are eliminated, the consciousness of the people is masked by what is provided by the colonizers as a type of new knowledge. This act has a great and devastating aborting effect on the encouragable African efforts to science and technology. Hence, if Africa is unrobed by the European greed and if its knowledge production is uninterrupted, there would be significant innovations and technologies.

The Europeans as colonizers thought the Africans as traditional and primitive. They characterized Africans as they do not know how and why things work (they lacked rational knowledge). But, here, it is not the case that the why and how questions do matter in the application and practice of technology as long as those technologies resolve practical human problems of survival and other production of knowledge.

So, the Western weakening of African efforts to technological and other productions led to be dependent on what comes from the West, i.e. Africans since long time have been seeking Western technology and being continuously dependent on Western technology. But, if local knowledge was given the chance to be guided by local principles and needs and negatively uninfluenced by Western imposition of their intellectual commodities, there would not be such

crackdowns of the African cultures and values that are endowed with massive knowledge sources. Relating this, there is a comment by a scholar named Hannerz who is cited in Mapadimeng's paper.

Hannerz acknowledges that the Third world cultures are to some degree influenced by First world cultures – e.g. that their technologies and genres which are not completely indigenous – he however dismisses the view that First world cultures necessarily pose a threat to Third world cultures. He argues that rather than openness to foreign cultural influences being seen as necessarily leading to an impoverishment of local and national culture, it should be seen optimistically. That is, that it could provide people in other cultures with access to technological and symbolic resources which could enable them to deal with their own ideas and to manage their own culture in new ways (Quoted in. Mapadimeng, 2009, p. 19).

The fact that should be known is that, European culture came to Africa during colonization not for a cultural exchange. It came here and degrades the mentality of the people of Africa and led to turn his/her face towards only their culture leaving his/her own. This in turn, led the African to be far away from him/herself. And today, since the important culture and technological efforts are disturbed Africans do not have something enough of his own to be exchanged with the West. But, this does not mean that there are no resources that can potentially be changed into scientific knowledge in Africa. So, the argument of Hannerz that first world culture does not necessarily impose its culture over Africans is not found to be satisfactory. It shall be argued that colonial past in one way or another had a strong influence on indigenous cultures and peoples. It replaces or determined to replace traditional knowledge and practices with European way of knowing. This highly limited the African people's capacity to overcome and solve their own problems.

In a nutshell, when we see deep into the case of the denial of African cultures and knowledge systems, there is one hidden Western project which follows the missionaries' exploration of Africa. This project is anthropology. It is dedicated to disrupt African identities which are deeply embedded in African people's lives. So, western impact on the development of African thought systems is a sort of thing which is subject to discussion. It is through employing anthropology that they concluded African cultures and traditions are not compatible with their

culture of doing things. Having the work of anthropology different ‘racist’ thinkers of the West posed their pejorative and deconstructive arguments towards the African people and cultures as a whole. This in turn greatly influenced the Africans way of thinking, ways of practicing knowledge and the ways of viewing the Western world. Most of the scholars of Africa are ‘baptized’ with Western knowledge and they are still servants of the developed world rather than helping their fellow Africans to be able to use and develop their own treasures. This is one manifestation of the Western influence over the minds of Africans.

4.2. Western Academic Racism and How It Undermines African Efforts

“In order not to rise to the human condition men sink into the dark depths of the zoological doctrine of race” (FRANZ KAFKA, in Emmanuel C. Eze, 2008).

To define racism, is I think a cumbersome task, for racism is a broad phenomenon. It is subject to different interpretations by different scholars and philosophers. But, the object of my argument here is just as in the above statement of Franz Kafka, racism is a sort of thing that blocks man from achieving and reaching the height that mankind deserves to reach; and to show how it undermined the efforts of Africans to develop scientific knowledge. It is believed that other than superficial differences like skin color, ethnicity, nationality, religious and other differences, there are no biological and genetically inherent differences of mankind. As Edward E. states “Race is a social construction which exists because of racist ideologies” (Quoted in. Eze, 2008, P. 177).

There are thinkers and scholars who classified race in different levels or taxonomies. Among these scholars and philosophers, well esteemed and prolific philosophers are found. Among these philosophers some of them are Hegel, Hume, Mill and some others (Keita, 1974). For instance, Kant classified human race into different categories according to their reasoning and thinking capacity (Eze, 2008). All the philosophers that I have mentioned above have the claim to give the white race or the European a special place by posing undermining arguments over other races of human beings.

But, they do not have enough and convincing evidence for their characterization of other races as inferior and unable to reason. For instance, their reason for Africans inferiority is that African

people have no history of any kind that Africans did contribute nothing to the heritage of mankind etc. They also asserted that Africans are inferior because they have no written languages and scripts. Of course, this argument concerns mainly Hume and that of Hegel, who focused on the History of the Negroes. Besides these philosophers also, there are anthropologists that galvanized the racist arguments of the philosophers and other scholars. As I mentioned the role of the anthropologists in my previous chapters of this thesis, they explore some tribes of Africa and collected some irrelevant evidences for the endeavor and the true status of African societies. Since their misplacing the important and relevant African values is intentional, they do not want to study and reveal the true manifestation of the people of Africa to the rest of the World.

Although scholars argued that Africans are not endowed with meaningful human activities in different areas like science and technological development and no history, their argument seems logically unacceptable. Although there was no experience of writing, there was scientific activity in different parts of Africa beginning from metallurgy to architecture, herbal medicine to psychiatry, agriculture to astronomy and many more. So, even if there was no experience of writing in Africa, it does not prevent the possibility of history (science, technology and philosophy) to be made.

The European history of science and other things are believed to begin at the time of ancient Greeks, and for that matter, the history of the Greeks is rather bounded up with the Egyptians and the Asians (James, 2009).

Lansana Kieta also argued that “The reason why Greek science and philosophy play such an important role in European culture is simply that there is no other source to which European culture could claim origin yet maintains the semblance of racial homogeneity” (Keita, 1974, p. 44). This is to mean that if Greece, which is thought to borrow its knowledge from Egypt does not exist, the history of Europe may not have been existed (ibid). From this, we can take the impression that European culture is associated and inspired by mere racial relations with the Greeks who appropriated knowledge from different sources. Here, it also shows that their blaming and under valuing Africa is groundless, but simply formulated to magnify their white race as superior. Hegel seems to some extent acknowledging the Asians as history begun in them

although culminated in Europe, but not the Africans (Cited in. Keita, 1974). History for Hegel includes none of the African nations and personalities. According to Hegel:

The history of the world travels from East to West, for Europe is absolutely the end of history, Asia the beginning for although the earth forms a sphere, History performs no circle round it, but has, on the contrary, a determinate East, viz., Asia. Here rises the outward physical sun, and in the West it sinks down; here consentaneously rises the sun of self-consciousness, which diffuses a nobler brilliance. The history of the World is the discipline of the uncontrolled natural will, bringing it into obedience to a universal principle and conferring subjective freedom. The East knew, and to the present day knows, only that one is free; the Greek and Roman world that some are free and the German world know that all are free. The first political form therefore which we observe in history is Despotism, the second Democracy and Aristocracy, the third Monarchy (Quoted in. Keita, 1974, p. 45).

Africa is forgotten in the statement of Hegel as not having any involvement in the course of history, when he argued that history merely began in the East and got its end in Europe, or in the West. Africa is described by Hegel as such:

For it is no historical part of the world, it has no movement or development to exhibit. Historical movements in it — that is in its northern part — belong to the Asiatic or European world. Carthage displayed there an important transitional phase of civilization but, as a Phoenician colony, it belongs to Asia. Egypt will be considered in reference to the passage of the human mind from its eastern to its western phase, but it does not belong to the African Spirit. What we properly understand by Africa is the unhistorical, undeveloped spirit, still involved in the conditions of mere nature, and which had to be presented here only as on the threshold of the world's history (Quoted in. Keita, 1974, p. 46).

Let me add the view of Hume and Kant. Although, as I noted earlier, these philosophers are among the notable in the eighteenth century Europe and their philosophies had influenced the world, it is also inevitable that they would be subject to criticism if not by other world scholars but by Africans; because the most affected are Africans.

Hume thought of black people as if they do not naturally possess specific mental capacities that are required to produce science and culture. He stated that:

I am apt to suspect the Negroes and in general all other species of men (for there are four or five different kinds) to be naturally inferior to the whites. There never was a civilized nation of any other complexion than white, nor even any individual eminent either in action or speculation. No ingenious manufacturers amongst them, no arts, no sciences. On the other hand, the most rude and barbarous of the whites, such as the ancient GERMANS, the present TARTARS, have still something eminent about them, in their valour, form of government, or some other particular. Such a uniform and constant difference could not happen, in so many countries and ages, if nature had not made an original distinction betwixt these breeds of men. Not to mention our colonies, there are NEGROE slaves dispersed all over EUROPE, of which none ever discovered any symptoms of ingenuity; tho' low people, without education, will start up amongst us, and distinguish themselves in every profession. In JAMAICA, indeed, they talk of one Negro as a man of parts and learning; but 'tis likely he is admired for very slender accomplishments, like a parrot, who speaks a few words plainly (Quoted in. Eze, 2000, p. 691).

This labeling of Negroes by Hume is to the level of animals or something between animals and humans. So, if the Negroes status is nearly animalistic, it might be taken as evidence to galvanize the slave trade.

Here also we can get Kant's similar view of human race as a determinant factor of thinking capacity. Kant believes Geography and anthropology are decisive factors for racial differences. He is in search of different factors that assure racial differentiation. One is skin color, by which he has classified human race in to four. For instance, Eze in his Book, *On Reason: Rationality in a World of Cultural Conflicts and Racism*, argued the following relating to the inconsistencies of Kant's idea of race.

If there was an empirical content to the concept "race" in the eighteen century, I have yet to find it. The closest is in Kant, when he claims that a chemical compound called phlogiston, in the blood of some races, but not others, is responsible of the

varieties in the species we attribute to racial difference. We know, at least since Joseph Priestley's experiments, that Phlogiston is what, today, we call oxygen. There is no empirical science that at this time claims that the oxygen in some races or ethnic groups is different from the oxygen in others. How does one account for this historical discrepancy between concepts and content? (Eze, 2008, p. 168).

This phlogiston is thought to be found in the blood of the Negroes and it is what made them black. This shows that how Kant and others were hopelessly wandering to assert racial peculiarities so as to claim that they are different from others.

This is enough to think that racism is the challenge of African thought systems to be considered as valid knowledge systems. And this also led the Africans and their thought systems to be characterized as something trivial and insignificant for scientific development. The quest for racial superiority and the claim of natural and inherent racial superiority caused the academics to be highly influenced and challenged, because unless Africans are considered as a real representative of mankind, how could one expect some innovative and creative ideas and deeds from them?

Despite the fact that there is ample evidence for the intellectual heritages of Africans in different areas, they have been neglected and pejoratively characterized as barbaric and outmoded who lives simply with direct contact of nature. Why the effort of Africans is not counted, when they produced different scientific and advanced technological knowledge as well as traditionally relevant practices that are almost not found in other areas of the world? Are these not what the African mind has produced? If so, how is it possible to argue that the African has an inferior and passive mind that is not capable of producing scientific knowledge? (These issues, I think need an immediate answer in further researches).

So, this racial differentiation gives rise to the academic problems of the Africans, although from time to time there is a sort of change in thinking of the Africans. But, the legacy of this racial thought left different problems that even today are dragging Africans backward.

Although the philosophers and scholars that I mentioned so far, are prolific and well known in their theories of knowledge and philosophies, referring on what they thought and formulated especially against the black race, it will not be counted as daring them to point out their racial

biases. The racism that the Europeans committed is manifested not only by the deterioration of some African values, but also of African man power and generations during the mass mobilization of Africans to the new continent. Hence, the racism of the Europeans cannot be understood externally of the Atlantic slave trade. Since by anthropologists and thinkers the African is placed above the apes and below the ‘fully humans’, slavery was legitimated. Here, we can see John Stewart Mill’s view of slavery; he noted that Slavery represented a higher degree or stage of development than tribal and low level existence. He said, “Slavery was permissible if individuals are lifted from primitiveness” (Quoted in. Noah, 200, p. 30).

Therefore, although it is believed that some Asian and African cultures at a certain time in memorial surpassed the Europeans in science and other civilizations, through gradual grabbing and erosion, they are left behind Western progress. The reason of this is, colonialism backed by racist thinkers and anthropologists who characterized the people and cultures other than themselves as poor in scientific and other thought systems. It is also true that although there was a movement of decolonization of Africa or decolonization is achieved, years have passed without changing the discourse of African inferiority because of the hangover of the past. This in turn led the Africans even today to be under the yoke of ‘recolonialism’ or neocolonialism, since they are technologically and economically impoverished.

4.3. The Scientific Method and Its Authoritarianism over Other Forms of Knowledge

.....nature, the subject matter which science attempts to investigate is very complex, ever revolving and has some tricks in her sleeves over humanity such that one method becomes inadequate to capture all her essences. __Chris O. Akpan (2010).

I will see here, the so called “ the scientific method” as it overlooked significant knowledge systems in many cultures of the world, it also overlooked and dislocated important African thought systems in its self-serving and self-glorifying tendency. My argument of this sort may go with thinkers as I noted earlier in the first and the second chapter like Feyerabend, Horton and Harding. It is true that knowledge cannot be fetched from a single stream in this vast world with an immense number of people and cultures. If we thought that scientific knowledge really is originated and developed from a particular culture, people in different places of the world which

is far from the place where science claimed to be developed would not have their own way of living and consciously intervene with nature. It has the failure to acknowledge the possibility that scientific knowledge can be used and originated from other parallel cultures. This has in turn a negative effect on other cultures to develop and use their local knowledge systems since this scientific method request them to import and embrace Western science which authoritatively left aside their science which could be developed and practiced alongside to the Western science.

The scientific method is about the belief that scientific inquiry is rational, objective and universal in its approach. Each of these criteria of science is thought to be unparalleled by other forms of knowledge. But, here when we see deep into the body of Western science itself, there is a sort of discontinuity and theory misfits in its historical proceeding. A theory that had been believed as true for a very long time by scientists may be shocked by the coming of a new scientist with a new theory. When this is so, the longtime existed theory and the scientific community refuse to welcome that new theory. In this Feyerabend argued that “the consistency condition which demands that new hypothesis agree with accepted theories is unreasonable because it preserves the older theory, and not the better theory” (Feyerabend, 1993, p. 5). This shows the fact that the scientific method itself is highly challenged by incommensurable theories and its refusal to accept the newly produced theories is the sign of its dogmatism, and authoritativeness not only to other local knowledge systems, but also to itself (ibid). He stressed more on theoretical proliferation than having one untouchable and unapproachable theory by other massive workable theories.

Feyerabend also noted that there can be many and different sorts of science. This is because of the fact that people from different social and environmental backgrounds may approach the world and learn different things. For instance, although Horton has no reservation on the importance and efficiency of the scientific method, he believed that “it is wrong to think that Western science is the only method of science to arrive at a certain exclusive truth” (Horton, 1967a, p. 57).

He also added that it is not only where the scientific method in practice that we find theories that succeed in different knowledge production and developing beliefs that are based on causal connections. Both Feyerabend and Horton did not claim that science is not important and scientific knowledge is not necessary for human development. But, the problem that both of

them envisioned is that science should not be arbitrarily attributed only to Europeans for there are ample experiences of such knowledge systems in other parts of the world which is resided by human kind. These scholars thought also that other things that are not scientific but valid in different circumstances should be incorporated as important things. According to them, science should not be the only measure of human excellence (Feyerabend, 1993, and Horton, 1967a).

Harding, on her part argued that, science is the product of culture and it is culture embedded or culture situated. Therefore, Western science itself is a kind of ethno science indifferent from other cultures because it is European ethno-science as there are different ethno-sciences (in Eze, 1997). Like Feyerabend, she thought that, when the sciences are in the service of the mighty, scientific neutrality ensures that might is right (Harding, 1995).

She has also the belief that, European colonial expansion helped them to turn the rest of the world into laboratory for their emerging science because they have induced their own thought to other cultures and this is also done through either intentional or unintentional destroying of competing knowledge systems in those occupied places (Eze, 1997).

So, when we see Feyerabend's, Harding's and possibly Horton's theme regarding the method and the claim of science, they seem to note that the place or the origin of human excellence and science is not a single area and tradition. So this will lead us to think that; if we develop such a claim, science will turn to be a mere dogma and ideology driven that strives to find a certain place where it never embrace other forms of thought.

The scientific method or mainstream science is a method that is based on a certain body of rules. It has been thought that anything which does not conform to this method will never be considered as science in the true sense of the term. This method is based on observation, experimentation and the formulation of laws or theories and further prediction and above all it has a strong claim of rationality, universality and objectivity so as to place itself beyond any knowledge system. All the way through, there is a sophisticated step in the formation of a scientific theory. Yet, my objective here is not to explain and define what the scientific method is: but as a highlight for my question that, what are the important African scientific practices that this scientific method has overlooked?

The scientific method is the other means of appropriation of scientific knowledge for the Western world in addition to Western imported education. Of course, the Western world assisted by modern science has achieved magnificent development. But, since Western science is the product of human intellect and individual thinkers, there are also other experiences in other parts of the world that could achieve similar wonderful achievements. The question which falls under this is: how is one culture and race the ultimate possessor of scientific knowledge that all other traditions are requested to conform? or is there a difference between method and validity? Such questions are inevitable when one tries to argue about the scientific method, because the scientific method does not consider the presence of other systems of knowledge that are as valid as mainstream science. But, if really validity is the issue, we can find other knowledge systems without having conformed to mainstream science. As I stated in the previous chapters we can see china and other East Asian countries who are achieving different advanced technologies. So, it might also be true that Africans, if they were not under European colonization and interruption of advanced technologies of the time, would achieve such things today.

When we raise the issue of method, the African scientific practice may not have advanced method of its own. For this, it is labeled as if it is mystical and religiously inclined than having a rational and systematic formulation. As it is noted, science is based on observation and experimentation to produce knowledge, if this is the case, some African traditional scientists also undergo such activities. We may take Akpan as an example here.

The method of science is generally anchored on empirical observation. Thus, like the Western scientists, traditional African scientists employ the technique of empirical observation in their day to day activities. Of course, they do not only stop at observation. They carry out experiment and arrive at scientific knowledge. In fact right from the earliest times our African ancestors are believed to have through empirical observations arrived at such scientific knowledge, for instance, they know how to ferment palm wine by the process of traditional distillation to be turned into gin (Akpan, 2010, p. 15, emphasis added).

But, this type of experimentation and observation is not advanced like that of the modern scientists activities. Simply it is to show that even in the traditional sense there is not only spiritual and religious inclination or interpretation of things. It is only in some cases that there

are mistico-religious practices and at this time, there may not be a rational justification for things or scientific claims. The practice may but be effective in achieving its goal at times. This may lead us to a similar case even in modern science that the problem of justification sometimes prevails. And lack of justification is not peculiar to the African thoughts. For instance, Akpan tells us that “Newton, who is one of the foundation layer of modern science, himself could not explain convincingly the underlying forces that is behind gravity” (Akpan, 2010, p. 18).

So, even in modern science, it is difficult sometimes to reason out and give explanation to every natural outcome. But, it should be noted that still I am not equating or putting in equal footing the African and Western science at this stage, but to show that both are subject to problems at times.

When we say that Africa had significant thought systems, we mean both in the ancient time that was long before the rise of Western science and also that which is practiced even today in the era of modern science (Chinweizu, 2010).

The current practice of African science can also be seen in terms of traditional practice and modern practice. The traditional one is that which is practiced by traditional rural societies or practitioners which are practiced having an integrated body of knowledge and practices which is not but classified into the disciplines of a different kind. The modern African scientific practice is done by individuals who have the acquaintance with modern European science. These individuals use traditional scientific knowledge in association with modern science. In both cases the traditional knowledge systems are found to be significant. Ancient African science among other things was profound that most of the things practiced in areas of medicine, psychiatry and other technologies are still valid and fitting modern technologies. As I tried to see in the above chapters, African pre-colonial attempts in science were encouragable. Take medicine, for instance, in traditional African societies, there are physical and spiritual treatments unlike the Western one which inclined more in the physical and treatment of individual parts of the body. To have a broad insight of African medical practice, I want to take an idea from the following scholars; David Millar, Stephen B. Kendie, Agnes A. Apusigah & Bertus Haverkort:

ATM can be categorized as mind-body medicine. Some common medical principles have emerged over time in various African regions. These include several scientifically proven techniques and strategies, some of which are culturally specific

and of psychological importance. Among the common principles and procedures utilized in African Traditional Medicine (ATM) are hydrotherapy, heat therapy, spinal manipulation, quarantine, bone-setting and surgery. Incantations and other devices of psycho –therapeutic dimension are often applied (Millar, *et al*, 2006, p. 17).

So, the medical practice of the Africans was as such profound and comprehensive in its approach.

We can see also metallurgy, in different parts of Africa that ranges from gold, tin, silver, bronze, brass to iron/steel and others. Metal products can include different jewelries, currencies, weapons and other important materials. The process of production is also not easy, it included the separation of ore from the non-ore rocks, smelting by the use of bellows and different heated furnaces, smithing and further refinement and purring. The furnaces are like factories that produce multipurpose materials. In addition to medicine and metallurgy, there were also other forms of knowledge like mathematical, astronomical and building technologies as well as food processing and fermentation.

In mathematics different societies of Africa have their numbering systems like the Ishango bone notation of the Congos who had different sets of numbers, the Yoruba of Nigeria who have their own counting techniques(Chinwiezu, 2010). And more than this, the Egyptian Pyramids were believed to be constructed through the use of geometric knowledge and hence, there is an argument that even Pythagoras who was thought to be the father of mathematics, borrowed the rule of the hypotenuse of a right angled triangle from the Egyptians (James, 2009).

More notably also we can see the building technologies of Africa. There are time transcendent and spectacular building technologies of Africa ranging from the Egyptian pyramids to the Ethiopian Coptic Christian or rock hewn churches such as Lalibela and other cave carvings and also others in Zimbabwe, Ghana and so on. Here, I am not merely listing them, but to see how Africans were endowed with ample scientific knowledge despite the fact that they are considered as if they did not involved in science and technology.

So, my final point is that these all African efforts are left aside or not considered as scientific knowledge. When one tries to compare the African thoughts and sciences, what is taken in most

cases is the spiritual and magico- religious aspects of African experiences. These spiritual and mystical activities of the Africans may be effective in their practice, but they could not stand in competition with the modern Western science which is based on empirical and experimental knowledge. In this case, we can see Horton's and others' attempt of comparison of the two as I have noted in chapter one of this thesis. Although Horton has tried to compare the two, he was concerned more on the spiritual aspects of African thought systems. This is I think comparison of the incomparable because spiritual things or practices cannot be proven or justified the way Western science do. Horton's attempt to compare the two is not bad, but really not that way. So, if one wants to compare African thought systems and Western scientific knowledge, it could be better if the comparison is between scientific experiences of traditional African societies like medical, metallurgical, mathematical and building technology that are not the mystical side of African thought systems and Western science.

All what we say about African science and thought systems cannot be understood in the way we understand Western science, nor we can argue that African scientific and other practice has its own peculiar methodology. But, it is possible to argue that its validity and effectiveness can be compared with the modern scientific knowledge. So, they can be taken as other good additions of modern science if the efforts are being added to transform the traditional or cultural art and knowledge to a certain height or stage of development.

Chapter Five

Conclusion

In chapter one of this thesis, I have explored the theoretical context which is about the background and the introductory part of the thesis. And there is the conceptual framework under which I have framed my thesis. There is also the research question as well as the organization of the thesis.

In chapter two, I mainly concentrate on the extension of the literature review that I began in the theoretical context. In this, I discussed the essence of scientific knowledge that can be defined in terms of African traditional ways and in terms of A Western modern way. And I have reflected up on some African philosophers and scholars' conception of African thought systems.

In the third chapter, I have tried to show that whether African thought systems fit scientific knowledge and I pointed out the major scientific practices in Africa that are labeled by Western anthropologists and other scholars as uncritical, magico- religious and merely traditional and spiritual. I also tried to see the relation between African scientific practices and African cultures and religion. In this I have seen that African culture is a repository of different scientific practices and the scientific practices are highly intertwined with the culture of the society in high affinity than the Western science do.

In the fourth chapter, I presented the causes that hinder African thought systems from being developed and advanced. These causes are; Western education's impact on African cultures that still lets us to be seekers of Western education and technology. There is on the other hand, Western academic racism which affected the Africans efforts by giving a discouraging and derogatory name for African as if the Africans are not capable of doing science and any art. There is also the authoritative claim of the scientific method that is believed to be universal, rational and objective in its approach. In such of its claim, it does not want to acknowledge that it has incorporated different important knowledge systems from different cultures that are valid and effective.

So, in this thesis, I have tried to see African thought systems and their significance to the development of scientific knowledge. I have seen this in connection with the modern scientific

experience, because whenever we think of scientific knowledge, our mind is set only for Western science. And I have seen that African thought systems are the repository of different technical and spiritual knowledge that will be assets for the people of Africa. The essence of African thought systems is difficult to figure out because of the multiplicity of cultures and experiences. But this does not mean that it is impossible to have some common characteristics of the cultures. The important thing is that, since there are many different cultures in Africa, there is a possibility of having many experiences. These individual experiences produce different important knowledge systems of science, philosophy and so on. For instance, one culture may be excellent in knowledge of food preservation, the other may excel in metallurgical process. Others also are technically skillful in building technology, medicine and so forth. Therefore, this demonstrates the fact that the African way of doing and practicing things is not merely indifferent and unanimous as the Western scholars argued.

African thought systems before the coming of Europeans and after colonialism are found to be different. In the pre-colonial era, there were good efforts of Africans in different fields or areas. This is perhaps because they were able to use the resource of their culture unconstrained by challenges like the inducement of the Europeans to their lands. Many argue that there is the lost science in Africa which was magnificent at a certain time in history. This includes astronomy, boat building, medicine and others that were practiced by the ancient peoples of Africa very long before the rise of modern science. But, some of these are deteriorated with the deterioration of their respective civilizations and some others caused by the influence of Europeans during colonization. The coming of Europeans with their alien cultures to African way of living and doing things destabilized the previous experience of African people and thereby its continuity is to some extent aborted. Because Europeans were not caring for African cultures and values and it is true that their mission of owning African resources is through the reduction and elimination of those important African thought systems for African people. Fortunately, since the African thought systems are deep rooted in the community, Westerners did not affect some thought systems and practices. This also shows that how much traditional thought systems are vital to Africans to solve their own multifaceted problems. Hence, even today, there are some important practices in Africa.

In arguing that African thought systems are significant, I am not romanticizing that, what is all in Africa is significant for Africa. There are undeniably some traditions or practices that need to be neglected. For instance, practices that hinder development can be done hand in hand with the important practices. As we have seen so far there are sorcerers, witchcraft men or witchdoctors in many cultures of Africa including Ethiopia. They are most of the time effective in doing positive, but they also use such knowledge or art to the opposite purposes. In short, they have the knowledge of both harming and helping the people.

Therefore, witchdoctors and other traditional practitioners have their own problem bearing activities perhaps to the extent that they have good roles. This and other drawbacks should be corrected and modified in the way that benefits the people. Of course, such things are not scientific although they become effective. But, they could not be removed or left aside simply by virtue of being unscientific by their nature. Since the need is to solve human problems and if these are found to be sometimes effective in such a function, therefore, there is no reason that we should abandon them. They are also significant sometimes in guiding the empirical practices of herbal medicine men and more other practitioners. This in turn shows the reality that, African thought systems are rich in different experiences and knowledge. This also shows that plurality rather than unanimity is its approach.

African science and technological practice is found highly induced in the culture of the society. Of course, it is true that culture is the source of many things for the society not only in Africa, but also in other parts of the world. Science or modern science although it is advanced today and trying to claim that it is quite different from the culture of the society, springs from the culture of the society. So science in one way or another is subject to the influence of culture. But the African experience is even sometimes undetached from the culture of the society, i.e. Western modern science is progressing and distancing itself from the culture and tradition of the society and created its own 'empire', this is not true in the case of Africa, because still African scientific and technological practices are in the stage that cannot liberate themselves from the tradition of the people. For this, many reasons can be raised as I tried to do in the previous chapters of the thesis. One among the possible reasons is the influence and interruption of the Europeans during their occupation of Africa. This resulted the hampering of the development and advancement of African science and technology. Or by this cause, African scientific practices remain some of

them even deteriorated and others remain in place without a competitive ability with the unbridled advancement of Western science and technology.

The African thought systems are as I said, highly intertwined with one another. But there is also a possibility to point out the scientific and technological practices. That means, even though there is a holistic approach in this thought system, sometimes scientific practices that could be done without appealing to the spiritual and religious agency are found. Therefore when we squeeze this holistic thought system of Africa, we can get significant and relevant scientific knowledge. But this sort of scientific knowledge is not considered as science in the eye of many because of its embeddedness in the culture; and the practice is traditional. This characterization is, but not relevant for the reason that the African science for instance, the science of medicine is able to solve health problems of the society and sometimes even better than what comes from the Western synthetic medicine.

Since the very purpose of science is to solve the problems of the society, and African scientific practices are solving the problems of the people even though not at large, it follows that Africans had and have a science. But, the problem is, these African scientific practices are not found in the pace that modern scientific practice proceeds. And modern science, since it is based on a certain method, avoids everything that does not conform to it. So, since relevance and validity should matter when we do science, the African traditional technical practices also would better be taken as science.

So, all things under this discussion lead us to conclude that Western scientific knowledge is one among the possible knowledge systems of different cultures which is advanced and different but not special and exclusively different. Not all its products are effective and applicable everywhere in the World. As it has its strong side, it also has a weak side. Its weakness can be filled by local knowledge systems of different cultures, because cultures are the repository of such knowledge systems. There should be a horizontal relationship and dialogs among different experiences of cultures so as to have a more comprehensive and strong science. Western or modern science is without hesitation the most sophisticated science that is trying to solve different problems of mankind in different fields. But, it does not solve all problems of human beings like for instance, health problems, food security problems, and environmental cases and so on. So, there is an implication that in addition to modern Western scientific knowledge system, embracing of

different knowledge systems is needed if not totally, but to better solve existing human problems. The African thought systems with their plurality can be taken as assets for this purpose especially if there is the application of experiment for those traditional practices.

References

- Abebe, Zegeye & Vambe, Maurice. (2006). "African Indigenous Knowledge Systems" *Fernand Braudel Center*, 29 (4), pp.320-358. Retrieved from, <http://www.jstor.org/stable/40241671>.
- Abimbola, O. (2009). Scientific Literacy and the African World View: Implications for sustainable development of science education in Africa. (pp 344-362). Ilorin: University of Cape Coast.
- Akpan O. (2010). "The Method of African Science: A philosophical Evaluation." *American Journal of Social and Management Sciences*. 2(1), pp. 11-20. Retrieved from, doi:10.5251/ajsms.2011.2.1.11.20
- Ayala, J. (1994). "On the Scientific Method and Its Pitfalls: History and Philosophy of the Life Sciences" *Stazione Zoologica Anthon Dohrn*. 16 (2), pp.205-240. Retrieved from, <http://www.jstor.org/stable/23331738>.
- Azenabor, G. (2009). "Odera Oruka's Philosophic Sagacity: Problem and Challenges of Conversation Method in African Philosophy" *A Journal of the Philosophical Association of Kenya* 1(1), pp. 69-86.
- Basil N. (2005). "The Legacy of Colonial Racism in Africa" *Australian Institute of Policy and Science*. 77(4), pp. 27-32, 40. Retrieved from, <http://www.jstor.org/stable/20638352>.
- Bekele, Gutema. (2007). "Extraversion and the Goal of Education in the African Context." *African Study Monographs*, 28(3), pp. 107-123.
- Bell, R. (2002). *Understanding African Philosophy: A Cross cultural Approach to Classical and Contemporary Issues*. New York: Rutledge.
- Bert, E. (1991). "Identity and the Question of African Philosophy. *Philosophy East and West*", 41(1), pp. 95-109. Retrieved from, <http://www.jstor.org/stable/1399723>.
- Binsbergen, W.(2003). *The Underpinning of Scientific Knowledge Systems. Epistemology or*

Hegemonic Power? Version.1, pp. 1-33.

- Carrera, F. (2010). "African Traditional Medicine: Healing of Body and Spirit". *African charter Article*, Retrieved from, [http://www. Newpeople.co.ke](http://www.Newpeople.co.ke).
- Chinweizu. (2010). Ivan Van Sertima: Rehabilitating the Self Image of the Black African. *The Black Power Pan-Africanist Perspective*, (pp. 1-23). Legos: [S.L].
- Chirikure, Shadreck, Rob Burrett, and Robert B. Heimann. (2009). "Beyond Furnaces and Slags: A Review Study of Bellows and their Role in Indigenous African Metallurgical Processes." *Azania: Archaeological Research in Africa*, 44(2), pp. 195-215.
- Ciaffa A. J. (2008). Tradition and Modernity in Post Colonial African Philosophy. (pp. 121-145) XXI (1&2). Washington, Conzaga University
- Coetzee, P.H and Roux, P.J.A. (eds). (2003). *The African Philosophy Reader: A Text with Readings*. (2nd ed.). New York: Rutledge
- Diop.C.A. (1974). *The African Origin of Civilization: Myth or Reality* (trans.) By Mercer Cook. New York: Lawrence Hill Company.
- Diop, C. A. (1989). *The Cultural Unity of Black Africa: The Domains of Patriarchy and of Matriarchy in Classical Antiquity*. London: Karnak House.
- .Ekeke, E. .(n.d). African traditional religion: A conceptual and Philosophical Analysis, 22 (2).(pp. 1-9). Calabar: University of Calabar.
- Eze, C. E. (1997). *Post-Colonial African Philosophy. A Critical Reader*. (Ed.). Lewis Burg: Black well University Press.
- _____, (2000). "Hume, Race, and Human Nature", *University of Penn Sylvania Press* 61 (4), pp. 691-698. Retrieved from, [http:// www.Jstor.org/ stable/ 3654076](http://www.Jstor.org/stable/3654076).
- _____, (2008). *On Reason: Rationality in a World of Cultural Conflicts and Racism*. London: Duke University Press.
- Feyerabend, P. (1993). *Against Method*.(3rd Ed.). New York: Biddies Ltd.
- Flint, K. (2008). *Healing Traditions: African Medicine, Cultural exchange and Competition in*

- South Africa (1820-1948)*. Athens: Ohio University press.
- Gabriel C. (2014). “A Critique of Western Education and Search for a Functional and Environment based African Education”, *American International Journal of Contemporary Research*. 4 (11), pp. 178
- Hallen, B. (2002). *A Short History of African Philosophy*. Bloomington: Indiana University Press.
- Hallen B & Wiredu K. (n.d). Science and African Culture. Paper 1. Science and Akan Culture.(pp. 1-29).
- Hammigna, B. (2005). *Knowledge Cultures: Comparative Western and African Epistemology*. (vol.88). New York: Rodopi.
- Harding, S. (2008). *Science From Below: Feminism, Postcolonialities and Modernities*. Durham and London: Duke University Press.
- Hear,O. (1989). *Introduction to the Philosophy of Science*. New York: Oxford University Press
- Hoppers, A. (n.d). “Culture, Indigenous Knowledge and Development: The Role of the University”. Occational paper no_ 5 *Centre for Education Policy Development*, (pp. 1-42).
- Horton, R. (1967a). “African Traditional thought and Western Science: Part1. From Tradition to Science”, *International African Institute* 37(1), pp. 50-71. Retrieved from, <http://www.jstor.org/stable/1157195>.
- _____. (1967b). “African Traditional thought and Western Science. Part2”, *International African Institute*, 37(2), pp. 155-187. Retrieved from, <http://www.jstor.org/stable/1158253>.
- Hountondji, P. (1981). “Knowledge as a development issue” .In K.Wiredu, *A Companion to African Philosophy* (pp. 529-537). Carlton: Blackwell Publishing.
- Hountondji, P. (1990). “Scientific Dependence in Africa today: Research in African Literature”, *Indiana University press*, 21(3), pp. 5-15. Retrieved from,

<http://www.jstor.org/stable/3819631>.

James, G. (2009). *Stolen Legacy: Greek Philosophy is Stolen Egyptian Philosophy*. University of Arkansas: Pine Bluff.

Kagema, N. (2014). The Relationship between Religion and Science in Mission. *Research on Humanities and Social Sciences Reflection from an African Perspective*, 4(2), (pp. 46-54) Chuka University, Kenya

Keita, L. (1974). "Two Philosophies of African History: Hegel and Diop", *Présence Africaine Editions* , pp. 411-49. Relived from, <http://www.jstor.org/stable/24349808>.

Lee, B. (2004). *African Philosophy: New and Traditional Perspective*. New York: Oxford University Press,

Luisse Iles & Edwinus Lyaya. (2015). "Making Metals in East Africa and Beyond: Archaeometallurgy in Azania". *Azania: Archaeological Research in Africa*, 481-494. Retrieved from, DOI: 10.1080/006720x.2015.1102941

Mapadimeng, M. (2009). Indigenous African Culture and Relevance to Socio Economic Development in the Contemporary Era. *National Arts Council of South Africa*. (pp. 1-25). Akra, Ghana.

Millar David, Kendie B. Stephen, Apusigah A. Agnes & Haverkort Bertus (Eds.). (2006). *African Knowledge and Science: Understanding and Supporting the Ways of Knowing in Sub Saharan Africa*. Bolgatanga: Compass books

Ndaba, W. (2010). The Challenge of African Philosophy. A Reply to Mabogo More. pp.174-192. Sabinet Gateway, [S.L]

Offiong, A. (1999). "Traditional Healers in Nigerian Health Care Delivery System and the Debate over Integrating Traditional and Scientific Medicine", *George Washington University Institute for Ethnographic Research* , 72(3), pp. 118-130. Retrieved from, <http://www.jstor.org/stable/3317426>.

Oloyede, O. (2010). "Epistemological Issues in the Making of an African Medicine",

- CODESRIA, 14 (2), pp.74-78. Retrieved from, [http:// www.jstor.org/stable/24487596](http://www.jstor.org/stable/24487596).
- Okere,T. (2005). “Is there One Science, Western Science?” *CODESRIA*, 30 (3), pp. 20-34. Retrieved from, <http://www.jstor.org/stable/24484618>.
- Resnik,B.(1998). *The Ethics of Science: An introduction*. New York: Rutledge.
- Selin, H. (1993a). “Science Across Cultures. Part 1, African and Native American Achievements”, *National Science Teachers Association*, 60 (3), pp. 38-44. Retrieved from, <http://www.jstor.org/stable/24147266>.
- _____,(1993b). “Science Across Cultures. Part. 2. The Chinese and Islamic Achievements”, *National Science Teachers Association*, 60(4), pp. 32-36. Retrieved from, <http://www.jstor.org/stable/24147118>
- Thagard, P. (1993). *Computational Philosophy of Science*. London: Bradford Books.
- UKPABI S.C. (1970). “Western Education and African Culture”, *pres'ense Africane Editions* (75), pp. 163-172. Retrieved from, <http://www.jstor.org/stable/24348839>.
- Wahlberg A. (1999). “*Harding's Is Science Multicultural?*” (Rev.), Penn State University Press 10 (2), pp. 118-119. Retrieved from, [http:// www.jstor.org/stable/43587668](http://www.jstor.org/stable/43587668).
- Zaslavsky, C. (1970). “*Black African Traditional Mathematics*”, *National Council of Teachers of Mathematics*, 63(4), pp. 345-356. Retrieved from, <http://www.jstor.org/stable/27958390>.

