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PHILOSOPHICAL FOUNDATIONS OF YORÙBÁ FOLK SCIENCE

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### Abstract

*The study determined the Nature and Methodology of Africa Science; identified the similarities and differences between Western and African Science; assessed the Yorùbá folk science and characteristics; and identified how Yorùbá folk science could be useful to contemporary philosophy of science. This is with a view to established the absolute and relative presupposition of Yorùbá folk science with a view to systematizing them into patterns of intelligibility that will facilitate their being susceptible to rigorous critical analysis and rational evaluation. The research study adopted a qualitative methodology. Data were collected through interviews and relevant literary text on Yorùbá culture and Yorùbá folk science. The population is Nigeria and Benin republic with the focus of obtaining data on Yorùbá folk science particularly in the Southwestern of Nigeria. The study discovered that, unlike in western science which attempt to understand nature is solely limited to empirical facts and observation, Yorùbá science transcend the realm of the physical to the non-empirical as it attempts to understand not only the physical reality that surround the Yorùbás but also with the non-physical realm. The study also discovered that Yorùbá folk science has some basic ideologies and practices which actually calls for critical questioning and which is capable of forming a new terrain of inquiries in contemporary philosophy of science. The study came to the conclusion that Yorùbá folk amidst other Africa culture have a science which is rich and knowledge embedded just like that of the western science. Contrary to the view held that Yorùbá science is absolutely mystical and irrational, the study finds out that Yorùbá science although it deals with both physical and non-physical realities yet it is empirical and also promise solutions and understanding of the realities that surround man.*

**Key Words:** Yorùbá, Yorùbá folk science, Traditional knowledge, Witch, Wizard, Yorùbá Medicine, Taboo, Incantation

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### Background to the Study

Science is a systematic study of things in the universe that can be examined through empirical observation, tested or proven and verified. The subject matter of science majorly is man, and the natural environment which man finds himself. Science is deliberate efforts by scientist to master, conquer and control the universe which they found themselves. This enterprise is believed by some scholars to have dated back to the beginning of man's existence. It is believed that man in his daily activities has always been learning and observing the wonders in the universe he finds himself and as a result of this, he has been trying to overcome, master and control nature. In this process, it is believed that there has been accumulated scientific knowledge from his interaction with the nature.

It is therefore expected of all culture of the world to have its scientific enterprise or endeavor, though may not be the same with the prototype which we have in western science. For instance, Western science can be traced to the ancient Greek traditional scientific enterprise. However, the case seems to be different in Africa generally. It has been argued that Africa science is not science.

Some scholars have argued that what is obtainable in Africa including the Yorùbás is not science. Yorùbá science with all other culture in Africa has been construed to be mere arts of magic, witchcraft and sorcery so such science cannot be called science. However, this seems to be unfair on Africa image as a whole because if by the name science and by the meaning which can be derived from the name what Africa including the Yorùbás do can be called scientific enterprise. Although the Yorùbás scientific enterprise have been deprived the name science, all because of the use of magic and charms in some of its practice, yet we must know that these practices which is construed as forbidden cannot be separated from all other culture of the world, including the Greek culture. Before the advent of civilization and modernization, for instance, Greek scientist used to incur spirits or supernatural force just as it is done in Yorùbá land when it seems as if the problem they want to solve is tedious or the solution is not forthcoming. Also, there are some cultures of the world that engages in these practices and yet has never been probe as unscientific. Since culture of the world differs and the reality people believe in also differs, it is not always the case that what is obtainable in all scientific enterprise of these cultures was the same. So is the case with Yorùbá folk.

Yorùbá folk science may be traditional, crude, raw and not sophisticated as western science, yet in their science lies systematized body of knowledge about the universe and solutions to problem that can likely bewilders human society. all we need to do, is to advance it, refine the Yorùbá science, re-polish it, take away every form of mysticism that cannot be empirically verified and make it come up to standard like that of western science in its uniqueness.

### Statement of the Problem

There has been an enormous literature and debate on the existence of African science. Those who claim to prove the existence of science in Africa have not critically engage it; they have only succeeded in presenting the story line that has always been told about African science. Yorùbá folk science like African science has not been given a thorough philosophical attention. The few tangentially related works are not devoted to a study of philosophical foundations of Yorùbá folk science as expected. Works like Kiev (1964) which provides a methodology for the study of sciences, Ezeabasili (1997) which queries the existence of African science, Mákindé (1988) which has the traditional medicine as its relevant focus, Òkè (1995) which outlines the Yorùbá perspectives on empirical knowledge. In addition to this is western philosophy attempt that has made inquiries into western science. This works includes; Burt (1932), Russell (1962), Losee (1972), among others. However, there is no tangible attention placed on the philosophical foundations of Yorùbá folk science. There is need to make a philosophical inquiry into the basic ideas and practices of Yorùbá folk science which is prevalent feature of traditional as well as contemporary Yorùbá culture that include inquiries into the metaphysics, epistemology, logic and methodology of Yorùbá science, hence this study.

### Objectives of the Study

Establish the nature and methodology of Africa science;

Identify the similarities and differences between Western and African science;

Assess the Yorùbá folk science and characteristics; and

Identify how Yorùbá folk science could be useful to contemporary philosophy of science.

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### Research Questions

What is the nature and methodology of Africa science?

What are the similarities and differences between Western and African Science?

What is Yorùbá folk science and characteristics?

How can Yorùbá folk science be useful to contemporary philosophy of science?

### Methodology

The research study adopted a qualitative methodology. The methodology includes a secondary analysis of existing research studies into Yorùbá folk science with a view to systematizing them into patterns of intelligibility that will facilitate their being susceptible to rigorous critical analysis and rational evaluation. Journal databases consulted include SCOPUS, Spinger Link e-resources, JSTORE (All Discipline), Agora, and Ebscohost using search terms such as Yorùbá folk science. The paper is organized under five main sections. Section A - introduces the theme and provides background information on the the Nature and Methodology of Africa Science; Section B - similarities and Differences between Western and African Science; Section C – the Yorùbá folk science and characteristics; Section D - how Yorùbá folk science could be useful to contemporary philosophy of science. The research used interview and other written materials. Data were collected through interviews and relevant literary text on Yorùbá culture and Yorùbá folk science. The population is Nigeria and Benin republic with the focus of obtaining data on Yorùbá folk science particularly in the South-Southwestern of Nigeria, a part in North Central (which is Kwara Yorùbá speaking Kwara State) and two other location in Benin republic among the Yorùbá folk scientists, sages and Yorùbá wise men. The literary texts on Yorùbá folk science were part of the population to be used. Convenience sampling procedure was used.

### Results and Interpretation of Result

**Research Question One:** What is the Nature and Methodology of Africa Science?

African is a large continent with diverse cultures. The way of life of Africans are different based on their cultural beliefs system, tradition, languages, custom, and so on. The

existence of African science has been totally denied by scholars as they made attempt to compare between African science and the western science. It was argued by critics that the essential features of science which is predominant in the western science is actually lacking in African science and if this is the case such sciences which do not possess these features cannot be regarded as science. Since African science is believed to lack these features Africa is said to be devoid of science. They see all inquiries into nature as that which is not qualified to be called science. However, it is pertinent to add that it was a terrible mistake on the part of critics to try comparing these two different sciences together. African science cannot be compared with western science the reason being that the two sciences emerge from a different culture and at the same time they address the different issues. Although, they may have some similarities even in their argument yet they differ in their interest of inquiries; thus, their explanation about things most times often clash.

Bajah (1980) argued against the notion of the existence of an African science that “there is science in Africa but there is no African science”. To him there are bodies of thought or knowledge in Africa about their natural environment however these bodies of knowledge cannot be regarded as science since they lack all the essential features of science. However, Contrary to those who deny African science, several attempts have been made by scholars to prove the existence of African science. A profound assertion on the existence of African science can be found in Brian Murfin’s (1992), who distinctly responded that, there is African science and its existence is what calls for the activities, the nature of understanding and explanations of the phenomena that occur in Africa. He concluded that as science exists in other parts of the world, there is also African science where efforts are made by traditional thinkers in Africa through their years of training in attempts to unfold the truth in nature (Murfin, 1992). That is over the time Africans has actively participate in interacting with his environment; attempting an understanding and an interpretation of what happens in the universe. If science as it is defined is simply a body of knowledge which depicts an understanding and interpretation of what happens around man, then why should African thought system be an exception. This is further buttressed by Ezeabasili (1977) posited that the African has an authentic scientific culture. Accordingly, African science is "African account of nature and how it works" apparently, this debate on whether there is African science or not continued for some time until

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Chimakonam (2012) first attempted a broad-based system in African science.

Affirming this, Afisi, (2016) defended the existence of method of African science which can be term as scientific from the pluralist thesis towards knowledge, scientific inclusive, addressing science as a body of knowledge about the nature. He argues that there is a distinct method of 'African science' that can be termed scientific. To him, there exist varieties of inquiry beyond what has been developed in the 'West' which can still be justifiably termed scientific. He further argued that the social character of science, which makes it a part of social and cultural traditions, qualifiedly justifies 'African science' as a true science.

Emeđólu (2015). attempted to forge a new paradigm in African experimental science consolidates on the systematization approach of Chimakonam. Emeđólu's supposition is that African experimental science must be relishable on the inherent natural magical tradition that pervades the culture of the people of the continent. His reason is simply because "European science itself emerged out of its own magical tradition". He argues for the retaining of African culture and magical tradition as this to him has nothing to do with its science, since other science from different cultures are based on the tradition of its emerging culture. However, there seems to be a question if a science that has an inherent African magical tradition can be regarded as science? African science just like western science has its own types thought it may not be theoretically distinguished as it is done in the western science, nevertheless African science or indigenous African thought embrace Africa thought system about medicine, technology, nature, reality, man, man and his society and so on. Adénjì, (1988), Òsàtuyì, (1984), Òpèfèyítímí, (1999) respectively deal with the stylistics and logical forms and features of "òfò" known as incantation in Yorùbá land. Incantation is a verbal expression which the Yorùbás use in achieving a specific assignment. It is believed that Yorùbá control the nature even with this "òfò" or incantation and often times desired results are gotten.

**Research Question Two:** What are the similarities and Differences Between Western and African Science.

This section had attempted a discussion of science, its definitive feature, types and methodology and also into

differences between western science and African science. It has also looked into the debate on the existence of African science. Different view has been given on the debate. Some had argued that there is no African science due to the fact that African thought system which is called science lacks all the essential features which made a field of inquiry science and also it is believed that Africans are typically religious, magico- and mystical so they can never have what is called science, being the case, that science is typically observatory and more of experimentation. On the other hand, some scholars have proved the existence of African science. Arguing that deducible from the definition of science as a systematized body of knowledge about the nature in its full interpretation, understanding and explanation, African science is considered as science, some even argued for an objectification of African magical tradition as science.

Western science favours analytical and reductionist methods as opposed to the more intuitive and holistic view often found in the traditional knowledge. Western science is positivist and materialist in contrast to traditional knowledge, which is spiritual and does not make distinctions between empirical and sacred. Western science is objective and quantitative as opposed to traditional knowledge which is mainly subjective and qualitative, usually passed down through oral communication from generation to the next by elders. Western science isolates its objects of study from their vital context by putting them in simplified and controllable experimental environments that is scientist separate themselves from nature, the object of their studies. Traditional knowledge always depends on its context and particular local condition.

In general, a traditional knowledge system adopts a more holistic approach and do not separate observations into different disciplines as science does. They do not interpret reality on the basis of a linear conception of cause and effect but as a world made up of constantly forming multidimensional cycles in which all elements are parts of an entangled and complex web of interaction. However, with the difference that exist between western science and traditional knowledge one will see why it is difficult to compare the two. Trying to analyze and validate traditional knowledge systems by using external scientific criteria carries the risk of distorting such system in the process. At the same time, we cannot extract just those parts of traditional knowledge that seems to measure up to scientific criteria and ignore the rest. This process of

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cognitive mining would atomize the overall system and threaten traditional knowledge with dispossession.

However, these scholars had failed to make an explicit examination of African science which they claim to exist and on the other hand, critics had failed to realize that with the definition given to science, western science cannot be regarded as the only existing science. In this work, attempt was made to engage in a critical examination of Yorùbá folk science with a view to systematizing them into patterns of intelligibility that will facilitate their being susceptible to rigorous critical analysis and rational evaluation. This through exposition shall be done in chapter four of this work. Yorùbá folk science was critically examined in attempt to show if that which goes under the name Yorùbá folk science can really be called science.

**Research Question Three:** What is the Nature and Characteristics of Yorùbá folk science?

The historical Yorùbá developed in line with the earlier Mesolithic Volta-Niger populations, by the first millennium BCE. Oral history recorded under the Oyo Empire derives the Yorùbá as an ethnic group from the population of the older kingdom of Ile-Ife. Ile-Ife is regarded as the spiritual homeland of the Yorùbá while it was surpassed by the Oyo empire (Macdonald Fiona (2000) as the dominant Yorùbá military and political power in the 17th century. Yorùbá folk thought system are embodied in Ifá-divination, which is known as the tripartite book of enlightenment in Yorùbás land.

Central to the Yorùbá folk science is the conception of Yorùbá reality of universe. Unlike in the West, where only the empirical world or the physical world is seen as the only world which exist. Yorùbá folk believe that there is more reality than the physical world seen and perceived. Central to either African or Yorùbá folk science is African or Yorùbá metaphysics. Yorùbá notion of reality in return is inseparable from Yorùbá metaphysics as Yorùbá metaphysics and reality are mutually inclusive. Reality for the Africans including the Yorùbás is dualistic, namely, the invisible and the visible or the experienced universe. In the invisible or immaterial universe, according to African ontology, dwell God, which Yorùbás (called Olódùmarè) or the highest being; the ancestors, (babańlá) or souls of the heads of clans and of the departed relatives (ẹmí olórí-ẹbí); and nature gods (òriṣa), or spirits (ẹmí). The material realm, on the other hand, contains human beings, animals, plants, and inanimate beings. Placide

Tempels, (1959), starts off the hierarchy of beings, which he calls 'forces', in this order: God (Spirit or Creator) then 'the first fathers of men, of the different clans'; below them 'come the dead of the tribe', the living dead (as these are called in contemporary African scholarship); the visible universe contains in its descending hierarchy human beings, animals, vegetables, and minerals. The two orders of existence, in the African world-view, relate to and interact with each other. Ruch and Anyanwu (1981) differently restate this African vision of reality. 'It means standing in a particular relationship with all there is both visible and invisible.' Tempels' (1959) points that, 'The world of forces (beings) is held like a spider's web of which no single thread can be caused to vibrate without shaking the whole network.' The interactions and intercommunications between the visible created order and the invisible world of God, spirits, and ancestors are possible only through human beings, the ontological mean between beings acting above and below them. In this sense, the human being in the African world-view is the centre of creation with intimate and personal relationships above and below him/her.

Folk science describes ways of understanding and predicting the natural and social world without the use of rigorous methodologies. It can also be seen as the common wisdom in a given culture and gets passed down to generation as a meme. Yorùbá folk-science is a science that can be found within the rural Yorùbá people in the cultural setting. According to Carey (1985) and Gopnik (eds.) (1996) all of us (cultures) are said to have a set of folk sciences: intuitive ways of understanding the world in areas such as biology, physical mechanics, and psychology. These folk sciences are thought to have deep and interesting similarities to the formal sciences. Both are usually described as having coherence and internal consistency, as well as specifying certain foundational or ontological kinds as the critical entities of concern.

Yorùbá folk-science revolves round Yorùbás attempt to have a clear understanding of their environment by mastering the operations of all that makes the world they find themselves with the aim of providing solution to rising problem in their environment. Yorùbá folk science is like that of African science. Just as Akpan (2011:13) distinguish African science into two; traditional or indigenous and modernized African science. Yorùbá folk science can be divided into two; we have the traditional Yorùbá folk science and the modernized Yorùbá folk science. Traditional Yorùbá folk

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science refers to the activities of understanding, explaining and exploiting nature for man's use, which proceed from the Yorùbás beginning on Yorùbá soil by the Yorùbás. It is the scientific way Yorùbá engage the nature and its resources for the usage of man. Either in term of the soil, plants, animals, living and non-living forces in the universe and so on. It is passed down from one generation to another generation orally. It is not adulterated by modernization. This type of science also includes Yorùbá traditional medicine, Yorùbá art and science, the science of making rain, magic and charm and so on. Under this science inquiry are also made by into the work and operation of science just as it is predominated in the west. This science is mostly done in a crude way; some of these sciences have termed by western scholars as highly mystical.

The method of science of the Yorùbás is more like that of the western science. Though one may want to ask if the traditional scientist ever have laboratory and research apparatus for carrying out his experiment. The answer is negative. However, despite the fact that they may not have all this, yet one cannot dispute the fact that Yorùbá folk have science that can to some extent be equated with that of western science. Just like the west Yorùbá folk, employ the method of empirical observation in their day-to-day activities. They observed both normal and abnormal occurrence of things in their environment and from their conclusion or laws are drawn which forms the basis of their experiences. These experiences can be used at any point in time to solve rising challenges of difficulty.

Akpan (2011) pointed that they do not stop at observation. They carry out experiment not necessarily in the laboratory and arrive at scientific knowledge. Umoren (2001) posits that right from the earliest times our African ancestors are believed to have through observation arrived at such scientific knowledge of how to ferment palm wine by the process of traditional distillation into gin. They were conversant with the flora and fauna of their environment to the extent that they know the medicinal power of barks, leaves, stem, root, animals, fur, and so on which can be used to cure disease. Through observation they know some basic agricultural system; they know bush fallowing, shifting cultivation and even come to the understanding of how to process and preserve foods, without been thought by anybody. Through observation and some understanding of the nature, Yorùbá folk ancestors were able to come into the understanding of food that are good and edible and those

who are not edible or good for the body. They understand the work of nature and how to tame them. Through observation together with some magical art Yorùbá witch doctors, herbalists understand how to handle thunder, rain and prevent misfortune from taking place.

Through traditional science indepth knowledge of nature is known. The Yorùbá traditional doctors understand the name of land (orúkọ tí ilẹ̀ ñ jẹ́), water (orúkọ tí omi ñ jẹ́), fire (orúkọ tí iná ñ jẹ́) and so on. So anytime they want to curb misfortune caused by either of all these things, they do not just address the misfortune directly, they either speak or address the source of the misfortune by summoning the cause of it and addressing the metaphysical issues surrounding it. So deducible, neither the idea or observation nor that of experimentation is alien to the Yorùbás. Against the misconception against the Yorùbá that they take all things the way they are without proper scrutiny. Yorùbás do not take explanation dogmatically without proper observation over time.

Another important element in the method of science of Yorùbá folk is the idea of causality. Just as the idea of causality is paramount among western scientist so also is causality among Yorùbá folks. Causality is central to the notion of science in any culture of the world. It is crucial in the comprehension of natural phenomenon. In attempt to give explanation of phenomenon in the natural world, causal explanation is needed. Causality is the notion that for every event E, there must be a cause C responsible for it occurrence. For instance, for there to be smoke, it is believed that there must be fire somewhere responsible for it. Central to the notion of causality in Yorùbá land is Yorùbá cosmic vision of the universe. Akpan, (2011) points that for Africans universe is not something discrete but a series of interactions and interconnections between the living, non-living and living dead. Okolo, (2003) African conception of reality as that which comprises of interactions between man and other forces in the universe cannot be separated from African notion of causality. These agents are actively involved in the happenings in the universe.

This is why Kanu Ikechukwu (2014) points that; African does not just speak of mechanical, chemical and psychological interaction like his western counterparts. Africans also speak of metaphysical kind of causality which binds the creator to the creatures, the seen to unseen world, the spiritual to the physical and so on. In addition, Yorùbá

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folk scientists do not give explanation about empirical cause but also speaks of metaphysical, unseen cause of events. Yorùbá folk see the universe as an ordered universe and all events or happenings are caused and potentially explicable. So, to them, nothing happens by chance; Africans believe that all events or happenings in the universe are caused either by man or by other beings- like God, divinities, ancestors, spirits and so on. In the case where an event is not caused by man, it is often believed to be caused by these agents with a purpose. This is responsible for African non-mechanistic conception of causality.

Yorùbá folks do not believe in chance, they are of the view that everything that happens is cause by a being or force. Ozumba, (2004) points that what Africans call chance (if there is any at all) is when they are ignorance of the series of actions and reactions that give rise to a given event- that is Africans may regard an event probably as chance if they could not give a satisfactory explanation of event. But it is not the case that they do not believe it is caused by an agent, though they might not know exactly what or who the agent is. Apart from this exceptional case, every event is believed to be caused by other factor(s). No wonder the Yorùbá say in one of their proverb that: *ìsẹ̀ kì í déédéé sẹ̀* – that is nothing happens without a cause.

In attempt to explain occurrences, Yorùbá folks pay greater attention to extraordinary occurrences and not on natural or regular occurrences as done in the west. They focus on Extra ordinary events like drought during rainy season, a thunderbolt attack on a particular person house, a man that fell from a palm tree, and a woman being pregnant more than nine months. These events according to Kwame Gyekye (1987) have particular traits that make them mind disturbing- they are abnormal, discrete and isolated, they appear to be puzzling, bizarre, infrequent, and incomprehensible because they are not considered subsumable under any immediate known law of nature.

In the search for the cause of every event, Yorùbá folk, just like every other Africans are not only concerned with such question as how, but they mostly bothered with the question as why. Ikechukwu argues that Africans are not only concerned with whatsoever had happened but they are more concerned with “why it has happened.” Take for instance in the case of the man that was struck by thunder, they would

ask questions like: why did thunder strike that day? Why is it that specific man that was struck out of all other individuals presents? Why not another person? Why that specific time? And so on

Though it is not the case that the Yorùbá folk look into the “what question”- which is an empirical question; they also examined why events happens the way they did. Inoegbu (2014) points that “at the occurrence of an event, causality raises dual but complementary enquiries how and what.” The ‘how question’ requires a description of the event that has happened. In Yorùbá land, having understood how it happens- which includes the place, time, and situation, they begin to assess or examine the ‘why’. The question of why comes after the understanding of the question how. The two work hand in hand and this help to give a clear and precise understanding of what is to be explained.

At the point of asking the question why, Yorùbá would have move beyond what can be empirically verified and gone deep into knowing why it has happened. This finding can be known through the help of the sacred scientist like herbalists, traditional healers who have to consult oracle or search into the spiritual world for explanation. It is often reveal through Ifá divination or consulting other gods. Causes of these events or abnormal occurrences are traced to higher beings- Olódùmarè (God) Òriṣà (divinities or gods) Irúnmọ̀lẹ̀ (spirits or demons), *iyáami-àjẹ* (witches), *Alálẹ-ilẹ̀* or *Baba-ńlá* (ancestors) and so on who are believed to be part of the governing principles of the world. This happening is solved by consulting oracle to know exactly what to do to rectify the problem if it is a bad occurrence. After the causes are detected or known sacrifices can now be offered to deities that is charge of the occurrence.

Yorùbás contacts with their environment and the understanding they have about their environment gives them the understanding that happenings or events do not just happen without a specific cause. So, they make attempt to search out the causes of this happening or events, but in doing this they moved beyond the physical into the spiritual. Even beyond where the west sees as dead end; they search out even what the west sees as mere chance because they believed that their universe is an ordered place where events are caused either by man or by agents. Most times, causes of events are usually beyond what appears to human eyes, they

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often use spiritual eyes. In Yorùbá land, events or happenings are observed with both physical and spiritual eyes and lens. In solving these difficulties, they attempt both physical and spiritual or metaphysical solution.

Sogolo (1959) expatiating on Yorùbá notion of diseases submits that, for Yorùbás the causes of illness can be seen as a blend of supernatural forces and natural forces. For the traditional healer to solve such a problem, he has to look for the cause beyond the physical. He will look for the cause in the psychological and spiritual realm of the victim in an attempt to understand whether he/she has strained a relationship with either spiritual entities or with other persons within his community. It is only when the traditional healer has ascertained the causes of the problem at the supernatural level and has taken care of such (through performing of rituals or sacrifices) that he can apply physical medication on the victim with the conviction that once the spiritual is taken care of, then the physical problem could be completely solved.

This point to the fact that Yorùbás do not just limit themselves to one side of the medication, they apply both physical and spiritual but only proffer the spiritual solution with the assurance that the workability of the physical medication depends on that of the spiritual. This means that physical explanation and medication is incorporated into Yorùbás notions- not that the focus is only on the spiritual alone. Sogolo (1959) observes that this is also applicable in the western science where most times, doctor first of take care of the psychological state of the patient which can be equated with how Yorùbá folks take care of the spiritual aspect (which may involve the psychological state or the spiritual) of the patient before administering drug or herbs to the sick person. Details of Yorùbá traditional medicine was explicated in the succeeding section.

However, Yorùbá notion of causality just as earlier said is central to whatsoever explanations Yorùbá folk give about happenings in their environment and also bodies of scientific knowledge about Yorùbá universe is predicated on Yorùbá perspective of cause and effect which also goes a long way to inform their view about nature, animal, natural phenomena, and forces. Yorùbá folk science is all-encompassing; it looks deep into the universe which is blended into one in which Yorùbá folk find themselves. This

is the reason why most things termed as Yorùbá science or object of scientific research in Yorùbá land is often construed as non-scientific all because Yorùbá universe is different from that of the west and so situation or event which can be found in the Yorùbá land may not be seen in the west. So natural and supernatural happening are bounds to happen in Yorùbá land and when it happens it is often given both empirical and non-empirical explanation.

Yorùbá folk scientists are often time influenced by the Yorùbá cosmic world-view when making a causal explanation or prediction of events. Since it is believed that the physical world is influenced by the principal spiritual forces, Yorùbá scientist make reference to the Supreme Being, ancestors or other deities as the case may be in the course of explaining or predicting an event. They believed that these spiritual forces or beings have power over them together with the nature and so doing they can enhance or inhibit their scientific skills.

The traditional Yorùbá folk scientist believe in the efficacy of mystic-religious based scientific activities and products than ordinary empirical scientific ones. For instance, medicines given by the traditional healer are believed to be more efficacious because they can take care of the physical and the spiritual having been produced under the direction of the spiritual forces. Some of these medications are said to be revealed to the scientist as they consult these spiritual beings or forces. So deducible one can say that traditional scientists come about his science from the combination of empirical and mythico-religious approaches.

Generalization or universal law is another method prominent in Yorùbá folk science. Afisi (2011) points out that although theorizing which is so prominent among scientist in the west may not be profound in Yorùbá land yet one cannot deny the existence of universal law that seems to transcend territorial bounds. For instance, although the language of the Yorùbá folks in Nigeria may be different from that of Akan folks in Ghana yet traditional scientist in Yorùbá land who knows how to make rain or prevent thunder strike may understand the laws, signs which colleagues in Ghana uses. Afisi, (2011) suggests that it may be the case that traditional scientist have general laws, which may be unwritten but which they all understand. However, with this view one may be tempt to ask if such a science whose method is more of



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mystically and religiously inclined, superstitious, more practical than theoretical, idolatry than community driven, esoteric and so on be regarded as science. Afisi, (2011) points that many have inferred that the method of African science is misleading because of the nature of its methods and therefore such science is at best a pseudo-science. This is also peculiar to the Yorùbá folk science. The combination of empirical and the mystic-religious method of Yorùbá folk science has resulted in the inability of the scientist to offer rational justification to his claim. Solution and causes of problem often attribute to events or diseases often make their explanation doubtful. Take for instance; the treating of bone by orthopedic doctors in African which is also the same practice amidst the Yorùbá folks. Traditional doctors or healers often use hens and cockerels in setting fractured bones. They use hens and cockerels as the contact points in setting the fractured male or female fractured bones. In the treatment; they will break the particular joints or parts of the limbs of the hen or cockerel which correspond to the human victims' problematic area and then apply medication while massaging those points and as soon as the hen or cockerel is healed the victim is correspondingly healed.

Observing this, one may ask how the medication on the limb of a hen or cockerel transmits to that of the human victim without the physical contact. What is the relationship between the hen or cockerels and the human victim? Is there any kind of energy or force that moves in between the victim and the animal that can make the healing corresponding? These are likely question that arise in the mind as one examines how possible the healing of a hen fractured leg can be correspondence to that of the victim. However, though the traditional doctors may not be able to give a rational explanation to justify his points yet this does not negate the fact that such a scientific enterprise among Yorùbá folks.

Yorùbá Folk Traditional Medicine: Traditional medicine has been defined as the alternative or non-conventional modes of treatment often involving the use of herbs in a non-orthodox manner as well as the process of consulting herbalists, mediums, priests, witch doctors, medicine men and women and various local deities when seeking a solution to diverse illness (Bòròkiní,1). Yorùbá traditional medicine is a medium through which Yorùbás treat all various form of illness or diseases in their body system. Yorùbá medicine just like the western medicine falls into the category of Africa technology. It is an application of accumulated scientific knowledge of the universe, plants,

animal, forces into solving problem bewildering men in term of their health and well-being. To the Yorùbás there is no limit to what their medicinal practice can do. They believed that the only disease or illness which cannot be cured is that which the gods, ancestor, divinities, witches are not ready or willing to safe or cure. To them, unlike in western medicine where some illness cannot be treated, Yorùbás believed that all disease has specific cause and if the cause can be known definitely the sure can be gotten.

Yorùbá traditional medicine is all encompassing; it includes herbal medicine, bone setting, spiritual therapies, circumcision, maternity care, psychiatric care, massage therapy, aromatherapy, music therapy, homeopathy and so on. There are some specific people who are regarded as specialist in all these areas; some of them are profession who learned the medical practice, while some inherit it from their fathers or ancestors. Others are wise people who may be through contact and interactions with forces in their environment have come to learn basic medical practice. These specialists include herbalist, bone setter, traditional birth attendant, herb seller, occult practitioner, spiritual therapist, local surgeons, and traditional pediatricians among others. Apart from the fact that they are specialist, they also work with spiritual forces that govern the work of nature. Although Yorùbá medicine may not be sophisticated as the western science yet it cures disease which the western medicine can also cure and even operate more than that which the western medicine can do. Yorùbá folk medicine use different medicinal herbs, animal products, decoction, concoction, ointment, tisane, plants, charm, and so on for treating disease and infirmities. In Yorùbá land, local names have been used to describe traditional medicinal practices which includes; Oḷósanyìn, Elégbòogi, Oníṣègùn and Babaláwo.

Yorùbá folk science which preforms Yorùbá medicine is gotten from Olódùmarè (supreme God), Irúnmòlè (angel), visions and dreams, supernatural contact with spirit/ occultic world, signature, animals among others. Olódùmarè is believed to be custodian of all wisdom and knowledge in Yorùbá land, both spiritual knowledge, scientific knowledge, guidance, instruction and so on. So, he is often contacted for solutions to problems man encountered and diseases they may be afflicted with. He is contacted through divination, or through his messenger with the help of traditional doctors, herbalist among others. Irúnmòlè (angel) are messenger or intermediary between human beings and

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the creator. They are communicated with for medicinal plant knowledge. Vision and dream is another medium through which traditional healer reveals knowledge of diseases. When a patient consults a traditional healer, the healer must diagnose the cause of the illness and this may involve divination, part of which is dream/vision or trance to communicate with extra-terrestrial beings to determine the cause of the illness and also its cure, (Bòròkíní. 2014).

In Yorùbá land most of the traditional healer are often times also engage in hunting occupation and from this occupation through observation are able to get the knowledge of some effective traditional herbal recipes. According to Bòròkíní, (2014) such knowledge would have been acquired when for example the hunter shot an elephant. If the elephant ran away and chewed a specific plant and did not die, it is believed the hunter noted the plant as a possible antidote for wounds or relieving pain or where domestic animals chewed a leaf of a specific plant when that animal was ill and later recovered or when another animal accidentally chewed a leaf and died. This practice done by traditionalist is the same with that which is done in western science when western scientist keep animal in laboratories and are used to test toxicity level, pharmacokinetics, and therapeutic ability of a novel drug. Signatures on leaves or plant are also of benefit to traditional healer for treating disease.

Plants that contain white latex are used to increase production of milk in case of breastfeeding mothers and those with big ripe fruits are used to increase fertility in Nigeria for example. Yorùbá people most time involves in supernatural contact with spirit/occult world for causes and solution to diseases. According to Bòròkíní, this is the highest source of knowledge of traditional medicine. (Bòròkíní, 2014). Due to the contact traditional medicine practitioner had and still have with the supernatural realm, they have access to much fundamental natural knowledge that eluded the imagination of an ordinary man. They have abundance of secret knowledge about the universe, natural phenomenon, and different kind of diseases in them, so they easily apply this knowledge to situation greater than the capacity of ordinary man. Traditional medicine practitioner amidst the Yorùbá folk is often called Yorùbá scientist. There are many forms of supernatural contact which include communication with extraterrestrial beings, in dreams, imagination, guesses, trance and esoteric communications.

In Yorùbá land, the first man to practice medicine is Orunmila, who is believed to be endowed with knowledge of medicine by olódùmarè. He is referred to as the divinity of spiritual healing. Unlike in the western medicine, where

treating of disease is only limited to the physical and psychological treatment, Yorùbá folk medicine includes physical, spiritual and psychological medicine. Traditional medicine knowledge is often transmitted orally from one generation to another. Yorùbá folk medicine is an application scientific knowledge they have gather from interactions with the spiritual being and the natural environment to treating of disease and infirmities. Traditional medicine knowledge can also be learnt from local education from the specialist- this is what Yorùbá call Iṣẹ-Aláwo or Iṣẹ-Onísègùn or Omo-awo.

In Yorùbá land, it is believed that sicknesses are caused by evil supernatural forces. Such supernatural forces includes; sorcerer, witches/wizard, familiar spirit, and spirit gulch who are seen as peoples enemies. Bòròkíní points that the Yorùbás also believed that the heavenly bodies like wind, stars, sun, and moon are capable of influencing directly or indirectly the health and prosperity of every human being. They also believe that every tree and herbs have spirit that live in them which empower these herbs for medicinal purposes. So when they want to collect these herbs, they most time conjure the spirit of these herbs before they pluck them. They believed that every plant and animal had its esoteric name at the time of creation. The Yorùbás also believed that some of these plant and animal were humans before that have once lived on earth. In treatment of disease the healer first of all start with observation of the parent by seeking to hear the story that surround the disease, asking about the previous existence of the patient by investigating into the patient past life and his/her family.

Sometimes the healer may also conduct a visual examination of some organs of the patient, after this divination by consulting oracle or the gods about the sickness or disease and the appropriate treatment was done. This divination can come in different form; it may be in consulting Ifá, or other gods, or calling forth a spirit or watching like a television screen or pot of water after conjoining some spirits or gods who can unveil the secret behind the disease to them. In healing the disease, it can be done through the use of herbs, roots and some other medicine-like concoction, decoction, oily mixture (àdín), it can also be solid- oṣedúdú, crude balsams, resins, latex or gaseous- steam inhalation preparations, incense among others. Healing can also come through the use of saliva and sacred water- the herbalist will cast incantation on the sacred water before administering it to the patient. Healing can also be through incantation, ritual and sacrifices. This is done in complex spiritual cases. Cases like infertility, affliction, bareness, mental disorder, leprosy, ill luck, and those that are inflicted by the forces of darkness.

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To solve this problem, appeasement is done through rituals and sacrifices to appease the gods or the wicked spirit or person responsible for the sickness. Sacrifices are prepared and placed at designated places usually shrine, groove, forest, T or X- junction, near a river or other locations believed to be the habitation for ancestral spirits. The sacrifice is often time provided by the patients or the patient's relative under the supervision of the traditional healer or herbalist. apart from sacrifice, there is also ritual bath, during which the parent of the traditional practitioner makes incantation alongside as he/she bath with specially prepared water mixed with some herbal ingredients and bathe water is poured out on the street. In Yorùbá all of these methods of healing depend solely on the peculiarities of the illness or disease. Healing is also done through the use of magical practice such as incision, which is made on the skin with razor blade or shape object and a powdered drug is rubbed into the incision to allow for direct absorption of the active constituent of the drug through the capillaries.

In addition to this, there is also the preventive aspect of medicine in Yorùbá land just as it can be found in the west. According to Bòròkíní, magical herbs can be used for favour, protection and the antidote against food poisoning and spiritual attack. Herbs like àjéòfòlè, àjéòbàlè (croton zambesicus) and ìgí obo (erythropleumsuaveolens) are often used for preventive medicine because of the strong belief that these two plants drive away witchcraft and evil spirits (Bòròkíní . 2014). Still on the preventive medicine, Yorùbá often wear charms, amulets (ìgbàdí or olóndè) to protect themselves from evil occurrence. Sometimes, they also put charm on their doorpost in order to put off any likely hazard that may want to come their way.

Another form of medicine common in Yorùbá land which cannot be found in the west is the counter-medicine. It is preventive. It involves the use of native injections and medicinal rings which is of two types. The first one is popularly known as mádàríkàn- this is used to secure one's life from any evil. The second one is òwò - it is used to apprehend thieves and also for protection. Apart from this, Yorùbás traditional medicine practitioners also performs surgical operation, either in term of circumcision (both male and female), obstetrics and gynecology, abdominal surgery, removal of the uvula among others. Although Yorùbá folk medicine may not have sufficient and sophisticated tools, techniques, equipment or facilities, knowledge as demonstrated in the western science yet they do in their crude way the exact things done in western medicine.

Deducible, with the belief that all disease are caused by evils spirit, one may be tempted to ask that is it really the case that all diseases are caused by evil spirit? Can we say if some have malaria such person is afflicted by the evil spirit? It seems that some of the beliefs in Yorùbá land actually call for a critical scrutiny, because it is actually out of reason for an external observer to imagine how sacrifice will have to be made just because a patient is sick? More so an external observe may want to ask if such a crude and highly superstitious as it be called a science also be regarded as science with the way science is demonstrated in the west. One may even be tempted to question is all those so-called forces really exist at all.

Nevertheless, I think these entire questions are surmountable if one has a full grasp of what Yorùbá reality entails and how the operation of things or of natural phenomenon is. So, if Yorùbá land, just a little headache as small as one may think it is may be caused by a witch and if the real cause is not properly treated are address just as Sogolo (1959) notes one will realize that all the drugs used will not perform the function it is supposed to do. So just as orthodox medicine is central to science in the west in the same vein, traditional medicine is central to Yorùbá folk science. As they have contact with their environment, they acquired some scientific knowledge which they applied as solution to any challenges in their environment. Knowledge gotten from their contact in the environment preforms the solution they provide to problem or diseases that bewilder them.

Magic in Yorùbá Folk Science: Magic is also central to Yorùbá folk science and also plays key role in Yorùbás attempt to master their environment. Although because of the use of magic, charm, and incantation some have argued that Yorùbás or Africans are typically religious and so mystical, so they cannot be said to have science. It has also been argued with the use of magic and charms some of the scientific practices Yorùbás claims to be practicing them become very strange because, most of these magical practices cannot be experimented and they cannot also be subjected to observation. To them such science cannot be science. They argued that since witchcraft or magical practice is prevalent amidst the Yorùbás that does not mean we must grant such practice scientific status. They are of the opinion that since has always dissociated itself from such occult and mysterious practices, but the history of science never shows this. In the history of science, magic in Europe tradition was indeed the very matrix of a truly scientific

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experimentation (McNeill 1935). History reveals that modern science was about to make such rapid gains in 17th century only by plundering natural magic.

However, the reverse is the case that Africans believed in magic and charm does not in any way denied the fact that Yorùbá folk have science that can be experimentalized just as we have in the western science. With magic and incantation, Africans can control phenomena that surround them. No wonders they can make rain to fall when they want, and can curb the striking effect of thunders. Things are made to come into existence with the aid of magic. However, this magic and magical art seems to be more than what ordinary science can prove out. They can tame wild animals with this magic. Also, they can curb people who have been afflicted or bitten by any wild animal with these. With this magic they can call forth some things into existence. Many arts of wonders are done with these magical practices. Yorùbá art of science seems not be complete without this art of magic, as it is often believed in Yorùbá land that some events or forces cannot be handled just with mere physical intervention, it has to be handled metaphysically. However, the question is that can such a science whose foundation is magic and mysticism be called science? When compared with western science, is it not possible for one to deny that there is anything called science at all in Yorùbá land? How do we scientifically prove the authenticity of this work of magic? Is there anything called science at all. All they are just mere work of manipulation Yorùbá folk scientist? These and many questions readily come to the mind, when one examines Yorùbá folk science. But regardless of this, one cannot still dispute the fact that there is science in Yorùbá land, because if one critically examined Yorùbá science one will realize it is nothing different from what is done in western science and most specifically it is not different from what can be found in any culture of the world.

Yorùbá Folk Science Technology: Technology is one of the most important aspects of Yorùbá science. Though one may want to wonder if there is anything called technology at all in Yorùbá land. Although what goes under the name technology may not be boldly given the name technology in Yorùbá land, yet it is not different from what goes under the name technology in the west. It involves the application of accumulated scientific knowledge from the environment into solving pressing issues or problems in the society. as it discussed above in Yorùbá traditional medicine. It is applicable in this section. Technology in Yorùbá land includes, the art of pottery making, cloth weaving,

blacksmithing, creative arts and designs, sculptural work, telecommunication, transportation and so on that we may want to name with the recent advance in technology. Whatsoever advance in science and technology we may noticed or be experiencing now, we must know that they are not quite new, most of it have been practiced by the ancient Yorùbá scientist so also some other African cultures.

Traditional Yorùbá people even before the advent of telecommunication called network service or mobile service, used to embark on what is called telecommunication, where they send information from one village to another. Though it may not be as sophisticated as the modern-day telecommunication yet information is still being sent. They do what is called aroko pipa, where message is sent to one person or the others via some symbolic materials or objects. For instance; it may be tied red cloth or bird or some other objects depending on what the content of the message is. Yorùbás also engage themselves in the making of some agricultural equipment; equipment like cutlass, hoe, diggers, harvester and so on. With derived knowledge over the time, they also do some artistic creative designs, sculptural works depicting natural beauty or some artistic appreciation. Cloth weaving or making is also part of the by-product of scientific knowledge. The Yorùbás are prolific sculptors, famous for their malignant terra cotta works throughout the 12th and 14th century; artist also earns their capacity in making artwork out of bronze. Henry John (1989) Also in transportation, Yorùbás through their accumulated knowledge of uses of natural phenomena, create different transporting system which can aid their movement from one place to another. For instance, canoe, small boats, carts are made traditionally to transport them from one place to another.

Another aspect of technology in Yorùbá land is traditional Yorùbá medicine. This has been discussed in the preceding section. This involves the use of scientific knowledge about medicinal herbs, root stems. Bark, animals and so on to cure disease and also the use of magic, incantations, incision, chants to cure some disease that proves to be incurable from empirical observation. Aside these, there are some other technological innovations or inventions that have resulted from the Yorùbás scientific knowledge which though may be crude or traditional yet it is not different from what the new technology is offering now. All that Yorùbás supposed to do is to move forwards beyond what they have doing, to improve it and making it up to standard, because the

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emerging science and technology is almost making the traditional science and technology to be outdated or out of importance.

**Research Question Four:** How can Yorùbá folk science be useful to contemporary philosophy of science?

Although, contemporary philosophy of science has been filled with advances from western science so far, neglecting the fact that there are scientific inquiries or prowess amidst the Yorùbás that can be of help in contemporary philosophy of science.

- i. There is a new dimension to science which is embedded in Yorùbá science which if adopted can also add to the on-going debate in western science. For instance, there are scientific issues or topics; topics like death and reincarnation, spirit and existence of spiritual forces, witchcraft catching, amidst others which can only be found in Yorùbá culture and if adopted as topics that should be examined in contemporary science will help in widening the scope of contemporary philosophy of science to debate about man and his environment.
- ii. More so there are some inquiries or practice in Yorùbá land which they have mastered over the time that is also needed in western science, as no culture of the world can be said to be high land of all that is needed to master and control the whole universe.
- iii. Yorùbá folk science should be worked or improved by either the Yorùbá sages or scientist and the educated Yorùbá scientist, as there lies bodies of knowledge or scientific innovations which can be of help to the development of Yorùbás at large
- iv. The strong believed in magic and witchcraft should also be critically scrutinized, it should not just be accepted just like that. It must be subjected to logical scrutiny, as we know that it is not always the case that most events or problem that are said to be caused by supernatural causes are always caused by them. Some are caused by empirical factors which can easily be overcome in the course of advance in Yorùbá technical know-how.
- v. Yorùbá folk science has often time be neglected as not up to the standard of scientific investigation all because there is no sophisticated methods, equipment and techniques to strengthen what is been done amidst the Yorùbá folk science. To this effect, there should be re-awakening towards our indigenous folk science and also all necessary techniques, methodologies that can actually helped to advanced our scientific endeavor to

a point of standard like the western science should be adopted.

#### Conclusion

Conclusively, this research has been able to justify the existence of Yorùbá folk science and not only justify its existence but also demonstrate that Yorùbá folk are richly endowed with scientific knowledge which has been demonstrated in their attempt to conquer nature and subdued it. Although some scholars may want to probe the existence of science in what Yorùbás called science; this research has also showed that it is not the case that Yorùbá science can be compared with western science and its sophisticated method and techniques yet this research has proved that what goes under the name traditional Yorùbá folk science is the same as that which goes under the name western science. More importantly, this research has also showed that, apart from the fact that they engaged in the same scientific enterprise, Yorùbás folk science in its traditional form also move beyond the physical or empirical points of observation which western science stop. Yorùbá folk scientist deals, interact and handles both physical phenomenon and supernatural or non-empirical phenomenon around the Yorùbás with the aim of dominating and using the scientific knowledge to solve rising challenges in the society.

#### Recommendations

Although, contemporary philosophy of science has been filled with advances from western science so far, neglecting the fact that there are scientific inquiries or prowess amidst the Yorùbás that can be of help in contemporary philosophy of science.

- i. Yorùbá folk science should be worked or improved by either the Yorùbá sages or scientist and the educated Yorùbá scientist, as there lies bodies of knowledge or scientific innovations which can be of help to the development of Yorùbás at large
- ii. The strong believed in magic and witchcraft should also be critically scrutinized, it should not just be accepted just like that. It must be subjected to logical scrutiny, as we know that it is not always the case that most events or problem that are said to be caused by supernatural causes are always caused by them.

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