

## **SCIENCE, TECHNOLOGY AND AFRICAN CULTURAL RENAISSANCE**

**Emmanuel Iniobong Archibong, PhD**

Faculty of Arts

Department of Philosophy

University of Uyo, Uyo

[emmymark2jr@yahoo.com](mailto:emmymark2jr@yahoo.com)

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**Gregory Ebalu Ogbenika, Ph.D**

Department of Philosophy

All Saints Major Seminary, Uhiele-Ekpoma, Edo State.

[oshokwe67@gmail.com](mailto:oshokwe67@gmail.com)

### **Abstract**

*Reality is viewed from the lenses of belief system neatly embedded in culture and tradition. Science, it can be argued is a culture and tradition synonymous with the West. This is so upheld owing to the ontology of Western culture which is purely individualistic and explains why most scientific discoveries bear the names of individuals. The same cannot be said of African culture because the ontology of the African is founded upon the bond of brotherhood i.e communalism or community thinking. The study seeks to critically inquire into the cause of why Africa is backward in scientific and technological development with special focus on its cultural ontology as a possible explanation. The study however advocates for a "science and technological transfer" as the first step via a functional African government policies. Secondly, there has to be a reward system backed by the law which encourages African crafters of local technologies thus charting a new way for stimulating interests in Africans towards the material world which will eventually lead to the economic prosperity of the continent in the long run.*

**Keywords:** Communalism, Individualism, Science, Technology, Ontology, Renaissance, Culture, Tradition, Policy, Reward, Development

### **Introduction**

To make the assertion that Africa is backward when it comes to being a major player in science and technology will not be a baseless claim. This postulation may not be unconnected to the fact that most countries in Africa are developing

or still evolving. There were lots of developing countries (going by economic indices) especially in Asia that are faring better because they embraced the principles of science and technology as part of their policy statements who today are better for it. Most Asian countries like Singapore, Malaysia, Taiwan, Thailand, India to mention a few, some few years back, were struggling to survive because of the harsh economic reality they were faced with. But all that is history (at least in terms of economic indices) as the harnessing of science and its application (technology) has given these countries not just a face lift, but a big change in the direction of fortune and economic well being. Uduigwem noted that “without doubt, technological development has brought many good things to man. Specifically, it has improved his living standards and consumption habits” (158).

The scientific and technological attitude is one of progress and it has a lot of pragmatic benefits. It is an attitude of contemplation, observation, experimentation and crafting coupled with a high level of mathematical abstraction that the mind is capable of. These were the secrets that gave rise to Western science. This scientific attitude can be seen at work in great scientists like Galileo, Archimedes, Copernicus, Newton, Faraday, Edison, Tesla, Einstein, Heisenberg, Bohr amongst others. These were ordinary men who engaged their minds to work with careful observation and today, the world is better off for it in many positive ways. Following this great feat by ordinary men, Archibong believes that Africa can still achieve mastery of science and technology because even “modern science developed with a complex range of philosophy, scholasticism, mysticism, Christian and secular humanism. Its rational thinking also developed through a long range of change and formation with the experiments of the enlightenments” (159).

Nevertheless, we still have Cynics and skeptics who might argue that science and technology have created more problems to the world than it can solve. This kind of thinking no doubt is expected especially as science and technology can be used constructively and destructively depending on preference. This is why the principles of moral conduct should be applied when doing science so that scientists do not focus more on the negative aspect of science and technology. That said, the corpus of this work is to examine very critically, the rise of Western science and by extension technology as subsumed in its culture especially as an activity of man focusing this search light on the ontology of African culture and tradition. The essence of this is to ascertain or probe into the

reason(s) as to why Africa has not made much stride in the area of science and technology. Could this be because of certain belief system that acts as inhibition to developing the scientific attitude in Africans? Does African culture and tradition discourage the scientific attitude because of its ontology? Is Africa's backwardness with regards to scientific and technological progress a policy problem or a cultural one? How can Africa benefit from science following the Western paradigm? Some of these questions will form the bulk of the discussion in this work.

### **Understanding Science and Technology**

To begin with, science is a human activity channeled towards understanding the universe we live in. This universe has certain laws that are discoverable, the knowledge of which accrues certain benefits that are useful. All around us, we find examples of technological benefits from science which include but not limited to: television, airplanes, new medicines to conquer diseases, computers and the internet, synthetic materials for clothes and furnishings. Technology therefore becomes the practical skills or craft deplored following the principles of science to create material products that becomes either useful or harmful to man.

The word 'science' is derived from the Latin word *Scientia* which means 'knowledge' and "it is nothing less than knowledge of the whole universe that scientists seek" (Barbet 275). In seeking out this knowledge, the scientist employs certain methods (some open to philosophical objections). According to a commonly held view of scientific method (which owes much to the writings of Francis Bacon and John Stuart Mill) practicing scientists proceed roughly along the following lines:

As a result of careful observation of the world they may become aware of something to be explained. A tentative guess or suggestion called a hypothesis is put forward as a possible solution. The hypothesis is then verified or confirmed by means of appropriate experiments which qualifies it for the status of a theory and provides the backing for scientific laws (Barbet 276).

From the forgoing, we can deduce that science is not a haphazard activity just like technology. It is painstaking, thorough and requiring plenty of time and commitment if it must uncover the secrets of nature. Science does not give room for unverified beliefs, personal prejudice or idiosyncrasies. It is an enterprise

where the truth of a fact can be replicated by the scientific community. Thus for Mbat, “science attempts to “show by its organized activity that our knowledge of reality is possible through empirical data, which includes observations, measurements, experiments, tests and generalizations from experience” (24).

Furthermore, the reference frame of science is “matter”. Science does not burden itself with phenomena that cannot be proven empirically. This is why the senses are as vital to science as water is to fishes. Infact, John Locke once concluded “that there is nothing in the human intellect, which was not first present in the senses” (Mbat 24). This buttresses the point that the scientific enterprise has a clear cut focus and pre-occupation. It does not begin its inquiry in the senses and ends in something extra-sensual. Thus, for Alozie “materialism as the foundation of the sciences gained further grounds when it was articulated that matter could exist in gaseous, liquid and solid forms” (6).

One more interesting fact about science is its self-correctiveness. Science seems to be the only discipline which is open to a paradigm shift when a better theory surfaces. This may account for why scientific theory is evolving leading to further advances in science. This movement can be better understood from classical physics, to relativistic physics and to quantum physics; science is always forward looking. Kuhn opines that “a new theory does not have to conflict with any of its predecessors. It might deal exclusively with phenomena not previously known, as the quantum theory deals (but, significantly, not exclusive) with subatomic phenomena unknown before the twentieth century (506).

Applying the processes and the principles of scientific discovery in a practical way which is technology has helped industrialization in no small measure. Hence, most technological inventions and innovations are driven by the principles of theoretical sciences. For example, the science of quantum theory has aided in the manufacturing of televisions, camera, nuclear power, computers, lasers and so on. Science therefore provides the necessary framework to technology, while technology in turn provides science with ingenious precision instruments. These instruments extend the scope of human sources of knowledge and thus provide knowledge beyond human limitations (Uduigwumen 158).

## **African Cultural Ontology**

Another appropriate title for this can be “what underlies African culture”? Culture in its most commonsensical understanding is the totality of a people’s way of life. Culture informs a people’s belief system and general perspective about life showing clearly what their preferences are. Understanding Africa culture cannot be possible without first understanding the ontology of this culture. This ontology is what encapsulates the whole belief of the African. This is what identifies and unite Africans despite its heterogeneity. Some of these common elements are belief in one supreme deity and divinities, good and evil spirits, and ancestors. Egbe outlines some concepts that form most of the underpinning of the African when he states that “there are some words like soul, spirit, and immortality that bother on man’s relationship with the universe and God. Heaven, hell, Satan and Angels bother on the invisible aspects of the universe, the metaphysics or ontology that are stubborn for men to really comprehend (19).

It is important that the belief system of Africans are clearly understood. This is because it is in this belief that what they considered important is shaped as well as their choices and preference about life. For instance, one foundational belief in Western ontology is “individuality”. This has affected almost every area of the western lives even in the sciences as all we hear are individual names associated with inventions. Africans however sees reality from the lens of others (communalism). This is how Mbiti captures the point:

The deep sense of kinship, with all it implies, has been one of the strongest forces in traditional African life. Kinship is reckoned through blood and betrothal...this means that each individual is a brother or sister, father or mother, grandmother or grandfather or cousin, or brother-in-law, uncle or aunt, or something else, to everybody else (104).

African culture is therefore founded on a communalistic basis. There is no place for individuality in African culture except it is seen from the perspective of collectivism. One hardly finds a particular idea or invention, credited to an individual in Africa. All that we have is community ideas in folklore, riddles, and proverbs mostly in oral presentation. Archibong and Usoro observe that “for the Africans, the world includes the earth, sun, moon, stars and the other planets.

This permits the African cosmology to be described through myths. African thought recognizes a plurality of worlds and hierarchy of beings" (28).

In the ontology of the African culture, reality is interconnected in hierarchy of beings. The highest is God, followed by divinities, ancestors, spirits, man, animals, plants and minerals. Placide Tempels in his *Bantu Philosophy* vividly captures the hierarchy of force which is equated to being. For Momoh then, the metaphysical and spiritual underpinning of African culture is more of co-existence with nature, rather than conquest, more of collectivism, rather than individualism, more of holism rather than atomism, more of synthesis rather than analysis (59).

The ideal of life in Asian culture for instance is to flee from illusions of life process in the world; that of Western culture is to conquer the world of nature; but that of the African is to co-exist with nature and the world. Consequently, "existence-in-relation", "being-for-self-and-others", sums up the African conception of reality. Thus, whether we have given it a thought or not, the belief system of the African people as embedded in culture to a large extent affects and shapes the African experiences and perspective about life. The study shall now show the nexus between this claim and its polemic to science and technology. The communalistic ontology of Africa culture will not foster progress in the area of advances in science especially as seen from a cultural stand point. For scientific investigation requires some form of individuality, autonomy and independent research and not a free for all collective enterprise.

### **Science/Technological Cultural Transfer for African Development**

Western science has a long drawn history. Before the sophistication we see in science today, there has been an effort by individual philosophers cum scientists to try to break through the kernel of physical reality and to understand what really goes on out there. This strive can be gleaned from history texts on philosophy and science. For want of space, the study only focuses on modern/contemporary science especially as it began during the renaissance.

The renaissance is a period in the history of Western philosophy or science that ushered in real changes in scholarship. It was an age of industrial revolution where men in their freedom propounded doctrines and disseminate same in form of literatures owing to the advent of the printing press. It was an age of enlightenment. It was in this age that the Royal Society of London and the

Academy of Science of Paris was formed. Italy had its own learned societies too. The increasing popularity of natural science and confidence in its method made Olson to reason that:

Scientific methods with their rejection of arguments based on mere tradition or “superstition” and their demands for empiricism and reasoned arguments, might illuminate all domains of human interest and provide the foundation for an almost limitless progress that would be not only material, but also intellectual, social and moral (140).

Thus it would be right to say that the spread of scientific knowledge and confidence in scientific method lay at the very root of two of the great historical movements of the eighteenth century which is the Enlightenment and the Industrial Revolution. This can be argued further that they enlightenment and industrial revolution played a very significant role in the democratizing movement which culminated in the American and French Revolutions.

Apart from the great personalities of this era whose scientific ideas were seen as the cornerstone of modern science, personalities like Newton and Locke emphasized the primacy of empiricism and reason for the discovery of truth. The fascinating thing about this scientific culture is the material and economic value it creates for its practitioners and the societies. Little wonder, research grants and funding runs into billions of dollars and the western governments are not left out of these; policies were also formulated which created the needed environment for science to thrive.

The point has been made earlier that the focus science is wholly materialistic and this informs the ontology of western culture and tradition. This is why science is highly revered as a trusted pathway to knowledge about the material universe. Cohen and Nagel affirmed to this all important enterprise of science via its method when they contended that:

The method of science does not seek to impose the desires and hopes of men upon the flux of things in a capricious manner. It may indeed be employed to satisfy the desires of men. But its successful use depends upon seeking, in a deliberate manner, and irrespective of what men's desires are, to recognize, as well as to take advantage of, the structure which the flux possesses (162).

Many freelance thinkers have identified socio-political variables as the contributing factor to the crawling nature of scientific development in Africa. Even though investment in science and technology requires a strong political will, its root may have a cultural ontological basis. Since every culture has its peculiar view of reality, as a matter of fact, the view of a people on the nature of reality do affects whatever relationship the people may perceive as existing between these realities. Ojong states categorically that "African worldview lie in how it portrays the harmony which results from a complementary combination of metaphysical and epistemological categories. Such a harmony gives the African a holistic perspective of reality (206).

From the forgoing, it may just be that the reason why scientific development in the continent of Africa is foot dragging may not be unconnected to the African belief system as can be found in its cultural ontology. Therefore to develop scientifically and technologically, there may be a need for a cultural renaissance. And since science is deeply rooted in the western cultural ontology, it will be germane to study what makes it thrive in this area as a deliberate quest for Africa to learning the ropes. Archibong notes that "the non-material or supernatural realm has been a very contentious subject for the westerners because western science reduces all of the material including man to matter and their descriptions. Man is therefore held to be a composite of matter or atoms without a soul and spirit" (9).

### **Conclusion / Recommendations**

From the discussion so far, one truth that stands out is that Africa has its own worldview from whose lenses reality is viewed. This worldview is heavily rooted in communalism both in principle and in practice. However, it is not out of place to borrow something good from other cultures especially if its value to human existence and progress is of a higher premium. The world is one small global village where science and technology has bridged wider gaps and divides. At the click of a button, one is transported to unlimited information super highway. So many nations are investing heavily in scientific knowledge because they understand that the one who has indigenous or transferred science and technology has enormous command of influence and respect even in international politics. This is one reason why small countries like Iran and North Korea with their nuclear programme are giving super powers like America,

Russia, Germany and Britain sleepless night. China seems to be an “independent” country because of its “self-sufficient” status in science and technology.

This study aimed at setting the record straight and not advocating a total divorce or abandonment from traditional African culture. Rather, it seeks to examine how Africa can move beyond its cultural ontology into investing and getting massive returns in science and technology whose benefit cuts across every facets of human life. It further advocates for collaborations with other scientific and technological world powers via a re-structuring of Africa's foreign policies in order to build capacity through training in science and technology in exchange for what these nations may need such as natural resources. African students should be encouraged to take to science and technical education with incentives to be enjoyed beginning from secondary education such as scholarships and foreign excursion. Scientific researchers should be awarded grants in their various area of research alongside exchange programmes. These are incentives that can stimulate enormous interest in science.

In closing, Africa policy framers must be enlightened to see the importance of carving out policies in these areas that will set the center stage for Africa's scientific and technological renaissance. If most Asian countries such as China, Korea, Singapore, Malaysia, Thailand, Japan, India, and so on can be the destination of scientific and technological export despite having almost similar cultural and religious ontology as Africa, then Africa has no reason why it cannot raise its head high in this sector being blessed with enormous human and material resources thereby rising above poverty and underdevelopment. This is what renaissance entails and the time for Africa to begin to invest heavily in science and technologically related fields is now. But this cannot be satisfactorily done unless Africans understand how its communalistic framework hinders the growth of individual research expected in science and technology which is the paper's contribution to scholarship.

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