

## **Science, Technology and Change: Implications to African Cultural Development**

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### **Abstract**

*This paper examined the phenomenon of change from the background of the implications of science and technology to African traditional culture. The theoretical framework hinged on the assumption of the reality and necessity of the fundamental principle of change. The authors took a look at the aged-long Heraclites-Parmenides controversy over the reality of change and examined it within the context of the interplay between the growth of science and technology and its impact on African cultural development. The method of critical conceptual analysis was employed while the review of existing literatures on the subject provided the background to the paper. The paper concluded that the overwhelming impact of science and technology on African cultural development is a confirmation of the dynamism of culture, the necessity and the reality of the fundamental principle of change.*

**Keywords:** *change, culture, science, technology and development*

### **1. Introduction**

If there is any aspect of reality that human creatures cannot ignore, it is the phenomenon of change. The concept of change depicts reality or all that constitutes being as an evolutionary or dynamic process. It is a phenomenon that in all ages has been staring man at his face. The first ever conscious effort in considering the question of change and permanence was made by the Eleatic philosophers. Notable among them is Parmenides who contends that being or nature is absolutely one, no plurality or multiplicity. He denies change and motion. Parmenides considers the so-called change and plurality as provided by the evidence of our senses as mere appearances which are quite illusory (Turner 1903: 48). On the other hand, Heraclitus, as a theoretician of change, affirms that we are under illusion when our senses report static qualities in beings. It is his submission that everything in nature is in constant flux. 'You cannot step into the same river twice', (Allen, 1966: 43). 'From life comes death; from death comes life, sleep changes into wakefulness and wakefulness changes into sleep. In a word, nothing is ...all is becoming' (Turner, 1903: 54). It is worth embarking on a philosophical scrutiny of what normally goes unexamined in our everyday conceptions of nature and other natural occurrences. This paper provides a critical examination of the phenomenon of change from the standpoints of the aged-long Heraclitean - Parmenides controversies over the reality of change. This consideration arises from clashes between basic assumptions which seem to be embedded in our everyday thinking. There is a special problem of change because the common sense assumption about apparent change in things and events turns out to clash with the equally reasonable presumption that the so-called change in things and events are not real change but mere appearances (i.e. the assumption of nature as being static).

Our concern in this paper is, therefore, to show that: [i] the doctrine that nature is static and of the wholeness of being is false because it undermines something very central to our ordinary conception of change and the dynamism of nature. It, indeed, appears to be contrary to natural events and forces, [ii] the necessity of change is well supported by the continuing overwhelming impact of science and technology on African cultural development.

## **2. Conceptual Clarification of Change, Culture, Technology, Science and Development.**

The concept of change has been given different interpretations by various scholars. In its ordinary or commonsense form, the concept simply means ‘difference’ or ‘transformation’. There are two major kinds of interpretations namely, quantitative and qualitative change. Quantitative change refers to alteration in a system or organism in numerical form i.e. description that have to do with proportions in form of numbers and statistics. For instance, biologists will take as an illustration a period of simple growth in plants and animals in attaining its full structure (Kluckhohn & Kroeber 1952: 341). This is change perceived in terms of alteration in size or physical structure. This is not the sense in which change is conceived in this paper.

The qualitative change on the other hand is alteration in the nature or fundamental stuff of the system or organism. It is alteration that affects the status, worth or quality of such a system or organism. A good example often given by biologists is when a child or a plant undergoes growth. A child grows into maturity by developing vital organ of speech. This becomes noticeable when such a child is developing language ability (Further examples include alteration in relation to the texture or characteristics of a system or organism. Puberty, for instance, is a qualitative change noticeable in the child’s growth into adulthood because no organism can reproduce before attaining the stage. Closely related to the above stated examples are changes in humans such as height, weight, color, memories, characters, thought etc. This is the sense in which the concept of change has been conceived in this paper. The concern is with change that has to do with the nature, characteristics and form of African cultural systems as a result of the impacts of science and technology. Indeed, the fact that science and technology have far reaching consequences on African cultural systems is a confirmation of the reality of the phenomenon of change.

Culture has been conceived differently by various scholars. However, there are common features that characterize the concept in almost all its interpretations. Culture ‘stands for a people’s traditions, manners, customs, religious beliefs, values and social, political or economical organization’ (Makinde, 2008: 13). The major thrust of this definition is the centrality of shared beliefs and values which shape a people’s perception of reality and ultimately their philosophy. Makinde posits that ‘since every culture has its own belief and perception of the world, it could be said that the limits of language in a culture are also the limits of culture’s perception of the world of reality’ (Makinde, 2008: 15). The major point Makinde is emphasizing is that since language and cultures are very much related, beliefs and ideas in a given culture must be reflected by its language system. It is later shown in this paper that African languages, which constitute one important aspect of African cultures, have been grossly affected by foreign cultural influences. This, in a way, has led to “the problem of dwindling opportunities for social development and self-fulfilment” such that Africa is now “faced with a serious problem of cultural dislocation, involving a loss of capacity for deliberate, self-initiated change.” (Oladipo, 2007 : 102). Walter Rodney, from the anthropological point of view, defines culture in a way that it indicates national or personal identity. From his own perspective, ‘culture is a total way of life. It embraces what people ate and what they wore; the way they walked and the way they talked; the manner in which they treated death and greeted the new born’ (Walter Rodney, 1972: 2-3). This conception shows that culture depicts all aspects of human life-past and present. It includes their beliefs, rules of behavior, language, rituals, arts, technology, styles of dress, ways of producing and cooking food, religion, and political and economic systems. The anthropological definition recognizes technology as ingredient of culture. It is to this end that this paper examines the impact of technology on the African cultural system.

Moreso, among the factors that have contributed to the growth of culture which include politics, economy and technology, “the greatest contributors to the world’s cultural harvest – indeed the dominant forces are those societies that are also at the forefront of technological development” (Oladipo 2007: 105)

Edward Taylor defines culture as “ that complex whole which includes knowledge, beliefs, art, law, morals, custom, and any other capabilities and habits acquired by man as a member of society”(Taylor, 1871: 64). This definition sees culture as a powerful human tool for survival and as a fragile phenomenon. It is dynamic and prone to change. There is emphasis on the notion of identity of a given people. It raises the issue of the state of the identity of the African cultural systems namely, its fragility.

Science is conceived in a number of ways. For instance, Robert P. Morgan, et al (1979: xviii) defines science as “any activity resulting in knowledge and understanding about the world around us”.

Karl Popper (1963: 68) defines science as “a systematic subjection to testing of conjectured explanations of matters to be explained whereby objective proven knowledge of the physical, biological and social worlds is advanced and or extended “.This paper takes science to mean any systematic body of knowledge that can furnish us with very exact or accurate and reliable information about the universe. The paper is concerned with the effect of science and technology on African cultural heritage, prominent among which include African cultural values of chastity, modesty, heritage of respect, decency, moral uprightness and sanctity of life.

Technology is sometimes conceived as applied science which is directed towards improving the lots of mankind in terms of solving problems. It comes in different forms but generally as instruments and devices that perform specific tasks for mankind. According to W.K. Omoka (1991: 16-17), “technology is a complete task-specific ontological entity ...understood as a set of tactics...instrumentally agreed upon usages”. Technology is also referred to as “the study or knowledge of art, skill or craft. The skill involved in the fabrication or making of a thing”, (Ekweke, 2001: 256). Olusegun Oladipoalso attempts a very appealing description of technology as “essentially about creativity and innovation. It is about the development of new tools, materials and techniques for the improvement of human life for instance, freeing human beings, as much as possible, from the tyranny of nature and making labour-an inescapable fact of human existence-less burdensome, but more productive and fulfilling” (Oladipo 2007:105). In this paper, the concept of technology is, therefore, interpreted as the study of arts especially in relation to industrial skills or the application of science or arts. It is also conceived as the knowledge, method or mode of production of material goods to serve human needs. Our focus is on how technology has impacted on the African culture through the process of either conscious or unconscious change.

The conceptualization of development is multi-faceted. This is why Walter Rodney analysed it at the level of the individual and at the level of the social groups. “At the level of the individual, it implies increased skill and capacity, greater freedom, creativity, self-discipline, responsibility and material well-being...At the level of social groups, therefore, development implies an increasing capacity to regulate both internal and external relationships.” (Walter Rodney 1872:1-2).

In whichever way we conceive development, the people must be involved before developmental change can take place. Put differently, the people are the claimants of development and all developmental efforts are directed towards the survival of the people as they interact within a given society. And as O. S. Taiwo rightly notes, there is a symbiotic relationship between culture and development. “Development takes place within the ambits of a particular culture” and “the impetus for a particular developmental trend can be aided or retarded by culture.” This means that “culture provides the milieu for development and development also affects culture in some definite ways.” (Taiwo, 2006:81). For the purpose of this paper, development is conceived as advancement or improvement in the living conditions of the African people from the perspective of the significant impacts of science and technology.

### ***3. Influences of Science and Technology on African Cultural Development.***

This section examines the way and manner science and technology have affected African traditional culture. Section 2 above indicates that culture refers to the way of lives of the African people which include their customs, language, dress, behaviours and values. Debates on the influences of technology on culture are on-going. For instance, Molutsi P. P. (1991: 97-105) undertakes a study of the culture of Botswana as a case study of continuity and change in the African value systems, in the face of modern Western science and technology. The paper principally focuses on how modern western technology affects women in the light of their subordinate position in the traditional African societies and concludes that African value systems are witnessing a period of rapid change. This observation is very significant for this present paper which aims at affirming the reality of the fundamental phenomenon of change from the standpoint of the rapidly changing African cultural values as a result of the impact of science and technology. Elizabeth B. Silva, in her own studies (2012: 245-247), examines how changes in technologies and in family life form both part of processes of socio-cultural change. Focusing on cultural influences on family life, the paper posits that since our values and customs are by-products of culture, there is the need to reshape our values in order to save the family from the negative influences of technology. Also, Olusegun Oladipo conceives culture broadly as “a by-product of the various ways in which a society or a group of people have tried to cope with the challenges of life, it would not be difficult to see the connection between technological development and cultural enrichment”. (Oladipo 2007:105).

It must be noted from the foregoing analysis that the essence of change in culture as occasioned that the influence of science and technology is to bring about development. But this must not be pursued without considering its negative effect on African social order. Otherwise, African experience will be similar to those of the West. As Vincent Ado Tenebe rightly observes: “the technological advancement of the Western world has not led to a morally stable society, or to equality of all men and women in Europe or in America. Like every other society, the challenges, moral and otherwise, imposed by its time, most of which is technology driven”. (Tenebe 2016: xix)

Our focus in this paper is to affirm that the phenomenon of change is real and fundamental using the significant continued change of the traditional African culture owing to the overwhelming impact of science and technology. Our discussions shall centre on very important aspects of the indigenous culture of the African people such as marriage institution, music, social norms, social roles, traditional political authorities and so on. The paper in this section, therefore, posits that change as conceived from the standpoint of what we can classify as hybrid culture in Africa, is not an illusion or mere appearance as vehemently argued by the great philosopher- Parmenides (Turner, 1903: 48). His contention, as stated in section 1, is that the so-called change in things are not real change but mere appearances (the assumption that nature is unchangeable).

In a typical traditional African society, marriage institution is such that gives the bridegroom unlimited freedom to marry as many wives as possible. Polygamy is widely practiced in most traditional societies. The number of wives and children also determine a man's wealth in the society. This aspect of the traditional culture has been eroded by the influence of foreign religions and cultures through the instrumentality of technology. The mass media became a tool in the hand of foreign missionaries who through handbills, radio and televisions got the people of Africa assimilated into foreign cultures. Thus, the practice of one man one wife becomes the order of the day. Is this not a fundamental change? The answer is in the affirmative. It is really a change in the psychology of a typical African person. The practice of monogamy may however, also be as a result of economic considerations but the fact remains that religion and mass media play dominant role in the behavioral change. G.S. Sogolo once affirms that culture is the means through which people interpret reality but conceives of reality as unchanging. (Sogolo, 1987: 73). While agreeing with Sogolo on the former concerning culture as mode of interpreting reality, his latter statement that reality is unchanging is contestable. This paper shows that it is not only culture that is dynamic but also man and society. Apart from the fact that reality is conditioned by cultural interpretations, the fact remains that culture also serves as a basis of identity. This point has earlier been reiterated by Ali A.

Mazrui (1990: 7) when he presents seven functions of culture as providing lenses of perception and cognition, instrument for social control, basis for stratification and identity etc. As culture presents basis of identity of people in any society, it becomes the lens through which reality is perceived. In this sense, no human condition is permanent, not even human existence which is usually in phases. Culture is, indeed, a universal human capacity. Writing on a Basotho worldview and way of life, Gill Stephen (2010: 56-57) asserts that marriages were usually arranged by the family elders in the society and not by the young people themselves. He states further that “if negotiations were successful, the boy's family would send a certain number of cattle and other gifts...to the girl's parents”. This cultural practice has since changed among the Basotho people of Southern Africa. People now use money in place of cattle as bride prize. This fundamental change regarding traditional system of marriage has been brought about by globalization, civilization and advancement in science and technology through the introduction of currencies of different denominations as legal tender. Hence, to ignore this as mere apparent change is to undermine the fundamental necessity and reality of the phenomenon of change.

In what appears to be a defense of some traits of permanence in African cultural system, Molutsi (1991: 98) posits that “certain strong cultural values especially those relating to gender, sex roles, power, traditional medical and belief (religious) institutions still persist after so much colonial and even post-colonial onslaught”. The impulse of this proposition is that some African traditional cultural practices appear to defer forces of change. This paper takes an exception to such a belief. Concerning the case of gender; Molutsi (1991: 99-101) affirms that in most African societies, women do not generally own property. This assertion is no longer the case because women now own property of high value even comparable to those owned by their men counterparts. Surprisingly, even non-literate women in the remote villages that engage in petty buying and selling activities are sometimes richer than their husbands thereby becoming the breadwinners of their respective families.

On the issue of power, particularly in South West Africa, traditional rulers no longer enjoy absolute power to pronounce death sentence as such powers have been taken over by modern democratic political institutions such as the law courts. Kings are no longer above the law unlike in the past when nobody dared query their decisions.

Furthermore, on the issue of kingship rites, the selection and enthronement of a king which, before now had been the responsibility of kingmakers and traditional chiefs, have changed considerably. In most African societies, the selection and enthronement of kings are now subject to the approval of government. For instance, in Nigeria, on the day of coronation of a new king, it is the government or its representative that presents the staff of office to the new king. The implication of this is that government can dethrone or banish such a king out of the town when necessary. It is also pertinent to state that even African traditional medicines have become modernized in terms of procedures for consultations with the traditional medicine men and women and the packaging of indigenous medicines. It follows, therefore, that virtually every aspect of the African traditional culture has, one way or the other, been affected either by colonialism or overwhelming impacts of science and technology. This paper is defending the position that the change noticeable in African cultural practices is a function of a change in African consciousness and orientations which is beyond mere apparent or phenomena change. Hence, John Mbiti (1970: 61) appears correct in his proposition that it is the consciousness of men that determines their existence. In so far as human consciousness is subject to change, which in turn determines our perception of reality, there cannot be such thing as permanence in relation to the issue of reality.

#### 4. Conclusion

There is no gain-saying the fact that the pace of the development in any given society is predicated upon the degree of dynamism of the culture of that society. The discussions in this paper have shown that virtually every aspect of the African traditional culture is prone to change as a result of the overwhelming impact of science and technology.

The challenge facing African societies is therefore how to appreciate the fundamental place of the phenomenon of change, treasure the good part of our cultural heritage such as values of chastity, modesty, heritage of respect, decency, moral uprightness and sanctity of life and forego those ones that are anachronistic such as terrorism, power sharing tussle, religious intolerance and communal conflicts among others. Societies must realize that no condition is permanent even including life and matter of existence. It is the extent to which a society can shape its universe through the application of the human intellect and technology that will determine its identity among the committee of nations (Welzel, et-al 2003: 341-379). This is the reason why philosophy, as a branch of knowledge, always directs its focus on matters of existence. Thus, to conceive of reality as something that is static or permanent as maintained by some philosophers is a misrepresentation of the fundamental nature of reality, essentially its dynamic nature. Indeed, positive change drives development as societies that resist positive change cannot grow. Hence, we can reasonably conclude that science and technology in shaping culture present dynamic rather than static view of nature or the universe.

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