KARL POPPER'S CONCEPT OF SCIENTIFIC CHANGE AND DEVELOPMENT: IMPLICATIONS FOR CULTURAL DEVELOPMENT

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ABSTRACT

The reality of change is an inevitable fact in the universe. Almost everything in the universe is subject to change. In the scientific world, change is constant. Thus, scientific theories change constantly. The nature of scientific change and development has attracted serious philosophical attention. Karl Popper argues that scientific theories change and develop continuously. Such development occurs when an existing scientific theory is refuted, and subsequently replaced by a more testable one. Scientific theories must ever be subjected to critical tests. Hence, scientific development has no end, and there is no final truth in science. The researcher argues that Popper's idea of scientific change and development has implications for cultural development. Culture is not stagnant, and so, cultural practices ought to be ever changing and developing. However, some societies find it very difficult to question, and subsequently change some aspects of their culture. This article employs analytical and hermeneutical methods of philosophical enquiry to examine the implications of Popper's idea of scientific change and development for cultural development. It discovers that, following Karl Popper's idea of scientific development, no cultural practice can be said to be final. Hence, cultural practices should be subjected to continuous critical tests so as to foster continuous cultural development, and at the same time eliminate oppressive cultural practices.

Keywords: *Popper, Science, Development, Culture*

INTRODUCTION

The phenomenon of change is very common. This stems from the fact that it is very easy to observe that many things are subject to change; and people experience change always. Heraclitus, an ancient philosopher, seems to be correct in his view that change is very constant in life. Change exists in every aspect of human endeavour. The phenomenon of change seems to be one of the most permanent phenomena in the world. Another ancient philosopher, Plato attests to the fact of change, though he limits it to this physical world. Things in this physical world change often, while the 'forms' or 'ideas' in the 'ideal world' remain changeless. Stumpf (1994) describes Plato's forms as "those changeless, eternal, and nonmaterial essences or patterns of which the actual visible objects we see are only poor copies." (p.58) Hence, change is very constant and inevitable in this physical world, while the 'forms' in the ideal world are not subject to change.

Scientific research or investigation is an endeavour within the physical world of change. Thus, scientific ideas and theories are subject to change as well as development. The history of science attests to this. The scientific ideas and theories in the ancient period are not exactly the same with those of the contemporary period. It is very obvious that a lot of changes have taken

place. Such changes in scientific ideas and theories could be conceived as scientific development.

The nature of scientific change as well as development has actually been a source of serious worry to philosophers of science. They have actually tried to explain how science develops. Among the philosophers of science who devoted much attention to scientific change and development is Karl Raymond Popper. He is one of the renowned scholars in contemporary philosophy of science. Popper conceives any given scientific theory as a conjecture, and the ability to refute or falsify such brings about development of science, which is endless. This article argues that Popper's idea of scientific development has implications for cultural development. The questions that are very fundamental and scholarly very necessary in this study are: How does science develop? Can scientific development come to an end? What are the possible implications of Popper's idea of scientific development on cultural development? These and other allied issues are to be given serious attention in this study.

This article is partitioned into five parts or sections. The first part clarifies the concepts of change and development. The second part discusses Popper's idea of scientific development. The third part clarifies the concept of culture. The fourth part examines the implications of Popper's idea of scientific development on cultural development. The fifth part is the evaluation as well as the conclusion of the article.

CHANGE AND DEVELOPMENT: CONCEPTUAL CLARIFICATIONS

The terms 'Change' and 'Development' are used very frequently in this article. They are common concepts in the sense that people make use of them very often. However, people sometimes misunderstand them and apply them wrongly. Some even make the mistake of using them inter-changeably with the intention that they are synonymous terms. It becomes necessary to clarify the two concepts, and articulate the relationship between them. Change and development are related concepts, but they are not synonymous. Both of them cannot be used inter-changeably. Change is already implied when something fails to remain the same, but development may or may not be implied. Development implies change, but change does not always imply development. Development seems to be positive oriented, while change can be either positive or negative. “The concept of development embodies progress and growth as a goal.” (Njoku, 2004, p.3). Hence, development entails progress, but change may or may not entail progress. It is obvious from the above distinction that scientific theories change as well as develop, and thus they are not stagnant.

KARL POPPER'S CONCEPT OF SCIENTIFIC DEVELOPMENT

The reality of scientific development is incontestable in the scientific world, though philosophers of science disagree on the nature of scientific development. Popper is one of the philosophers of science that gave serious attention to the issue of scientific development. His account of scientific development is quite interesting. He believes that scientific knowledge develops continuously. This stems from the fact that science is in continuous search for truth. Thus, the search for knowledge is endless. Popper (1968) maintains that “...the striving for knowledge and the search for truth are still the strongest motives of scientific discovery.” (

p.278). The fact that science is ever developing is the major point that Popper tries to put across. This implies that scientific development cannot be terminated. In the words of Popper (1968):

(1)The game of science is, in principle, without end. He who decides one day that scientific statements do not call for any further test, and that they can be regarded as finally verified, retires from the game. (2) Once a hypothesis has been proposed and tested, and has proved its mettle, it may not be allowed to drop out without 'good reason'.(pp.53-54)

The question that is scholarly very pertinent in this article is: How does science develop? Put in another way: What brings about the development of science? Obviously, this was a great source of worry to Popper, and as such, he devoted serious attention analysing the nature of scientific development. He argues consistently that science develops by the refutation of the existing theory, and its eventual replacement by a more testable theory. This implies that no scientific theory should be seen as the final truth, but rather should ever be subjected to severe test or criticism. This stems from Popper's insistence that every scientific theory is nothing but a conjecture, which may later be refuted by another theory. The new theory that emerges after the refutation of the previous one becomes a new conjecture that avoids the mistakes of the previous one and explains phenomena better than the previous one. Hence, Popper (1968) states:

But these marvellously imaginative and bold conjectures or 'anticipations' of ours are carefully and soberly controlled by systematic tests. Once put forward, none of our 'anticipation' is dogmatically upheld. Our method of research is not to defend them, in order to prove how right we were. On the contrary, we try to overthrow them. Using all the weapons of our logical, mathematical, and technical armoury, we try to prove that our anticipations were false—in order to put forward, in their stead, new unjustified and unjustifiable anticipations, 'new rash and premature prejudices', as Bacon derisively called them. (p.279)

This implies that scientists ought to be ever very hardworking in their effort to refute existing theories, and replacing them with better ones.

Hence, no scientific theory could be said to have attained a final truth, and none should be sacrosanct. No scientific theory could be said to possess an absolute or irrefutable truth. There is no finality in scientific investigation. In the words of Popper (1968): "Science is not a system of certain, or well-established, statements; nor is it a system which steadily advances towards a state of finality. Our science is not knowledge (episteme): it can never claim to have attained truth, or even a substitute for it…" (p.278) Science progresses towards an infinite aim of ever discovering new as well as deeper problems, and of subjecting our ever tentative theories to more rigorous tests. The point Popper tries to emphasize is that any theory that emerges in the course of scientific development is just tentative. It becomes obvious form Popper's perspective that as science progresses, one becomes more aware of one's previous mistake and ignorance. This stems from the fact that every new theory takes into consideration the errors or mistakes of its predecessor.

It ought to be noted that Popper's idea of scientific development differs essentially from that of Thomas Kuhn. Obviously, Kuhn argues that in the course of scientific development, the new scientific paradigm that emerges after scientific revolution is incompatible as well as

incommensurable with the old one. Thus, Kuhn denies any common measure for comparing or evaluating them. On the contrary, though Popper agrees with Kuhn that progress in science is revolutionary, he insists, contrary to Kuhn, that two scientific theories can rationally be compared. Popper maintains that the new conjecture that comes after refuting the old one explains phenomena better than the previous one and at the same time overcomes the mistakes of the previous one. Also, the new theory that emerges in the course of scientific development ought to conflict with the previous one. Popper's view that successive theories can rationally be compared contradicts Kuhn's idea of incompatibility and incommensurability of successive scientific theories. Explaining further his idea of the revolutionary character of scientific development, Popper (1981) states:

As I have suggested before, scientific progress is revolutionary. Indeed, its motto could be that of Karl Marx: 'Revolution in permanence.' However, scientific revolutions are rational in the sense that, in principle, it is rationally decidable whether or not a new theory is better than its predecessor. Of course, this does not mean that we cannot blunder. There are many ways in which we can make mistakes. (p.95)

Popper further argues that though scientific development is revolutionary, it must be able to explain the success of its predecessors, and also, in other cases yield different as well as better results than the predecessors. The possibility of such lies in the existence of a criterion for judging the quality of a theory as compared with its predecessor. This implies that progress in science can be assessed rationally.

It becomes obvious from the foregoing that one cannot say that scientific development will one day come to an end. This is as a result of the fact that every new scientific theory ought to be subjected to test as well as criticism, and cannot be held as the final truth.

THE CONCEPT OF CULTURE

Since the focus of this article is on the implications of Popper's concept of scientific development on cultural development, it is scholarly very necessary to examine the concept of culture. The term 'culture' is a very common concept because every society or group of people is associated with a particular culture. Thus, there is no society without culture. Etymologically, the English word 'culture' was derived from the Latin word 'cultura' meaning 'cultivation'. The word 'cultivation' has to do with the intentional or deliberate development of particular skills or qualities. Imo (1990) states that in the non-technical sense, culture "is frequently used to refer to a person as someone who is cultivated, enlightened, and civilised; as when somebody is said to be "cultured". This means that such a person is being viewed as someone who comports himself in a way (of life) that is acceptable within a civilised setting." (p. 13) What ought to be noted is that culture involves human activities and has to do with nurture which is quite different from nature. The implication of this is that culture is of human creation, and thus not basically natural. This explains why cultural practices differ from society to society. What may be permissible in a particular culture may not be permissible in another culture. This is as a result of the fact that human 'values' differ from culture to culture.

Generally, culture is conceived as the total way or style of life of a particular society or group of people. This conception of culture is similar to the anthropological or sociological definition of

culture. Adelakun (1990) articulated the anthropological or sociological definition of culture thus:

The Anthropological or Sociological definition of culture is more appropriate and relevant. Here, culture refers to all the things which human beings do but which have no biological basis i.e all non-biological actions and behaviours of man are products of his culture….Such behaviours as greeting, shaking of hands and interacting are all learnt by human beings who need to learn and invent new ways of adapting to various social situations. Such learned ways of doing things, which are modified from time to time and passed from generation to generation constitute the culture of the people. Culture therefore refers to the total way of life of a given people. Thus it includes any piece or pattern of behaviour, the attitude, norms, values, objects, skills, belief system, and world out-look which human beings learn and adopt as members of a given human group or society. (p.5)

Hence, culture includes values, morals, attitude, language, laws, dressing style etc that are shared by the members of a particular society. Culture encompasses the world-view as well as the activities of people in a given society. According to Arowolo (2010), culture is "the collectivity of human activities and general principles that tend to guide ideas of a group of people with shared traditions (general acceptability), which are passed on, instilled into generation (socialization) and reinvigorated by members of the group (sustainability)" This definition brings out very vividly the fact that culture provides the guiding principles of life that shape the conducts of people in a particular society. It also underscores the fact that culture has to do with human activities as against natural occurrences. On his own part, Zimmermann (2017) approaches culture from the perspectives of the total characteristics as well as knowledge of individuals in a particular society. In his words: "Culture is the characteristics and knowledge of a particular group of people, encompassing language, religion, cuisine, social habits, music and arts." (Zimmermann, 2017, para. 1) Zimmerman brings out clearly the fact that culture is peculiar to a particular group of people. Thus, the culture of a particular group of people may be different from that of another group. The salient points to note about culture include the facts that culture is acquired and it is transmitted from generation to generation. Hence, cultural practices can be inherited and can as well be modified.

IMPLICATIONS OF KARL POPPER'S CONCEPT OF SCIENTIFIC DEVELOPMENT ON CULTURAL DEVELOPMENT

Popper's concept of scientific development, when applied to the domain of culture in general, could be said to have a lot of implications for cultural development. It o ought to be noted that the implications of Popper's concept of scientific development on cultural development may not be said to be total or absolute. This stems from the fact that science and culture are not the same both at the conceptual and practical levels. Besides, cultural practices may not be testable or falsifiable in the same manner as scientific statements and theories in Popperian sense. Nevertheless, some aspects of Popper's idea of scientific development throw light on what cultural development ought to be and the proper direction it should take.

It can easily be recalled that Popper argued that no scientific theory has attained the final truth,

and that it is only a conjecture which can later be refuted or proved to be wrong. Thus, every scientific statement remains tentative forever and the game of science has no end. These claims, when applied to the domain of culture, have very interesting implications for cultural development. Every group of people or society in the world is associated with a particular culture. No culture of the world could be said to have attained the final truth. Hence, every cultural practice at every point in time ought to be seen as a conjecture in Popperian terminology, which can later be refuted, and subsequently be replaced with another one. Hence, no cultural practice in any part of the world should be seen as final and untouchable. Cultural development should be endless. Thus, oppressive cultural practices should always be subjected to critical tests, and subsequently be replaced with good ones. Such replacement ought to be continuous, and not just once and for all.

Though culture basically is not stagnant, many societies of the world find it very difficult to change some aspects of their cultural practices. Some societies find it very difficult to question some aspects of their culture. Generally, cultural practices of 5th century may not be adequate in the 21st century because of the changing circumstances of things in the world. Some cultural beliefs and practices were adopted in the past to serve some specific purposes, which are no longer in existence today. Continuation of such beliefs and practices may look awkward in the present time. Cultural practices at every point in time should be subjected to severe tests and criticisms to ascertain whether they still serve the purpose. For instance, among the 'Igbo' people of Nigeria in Africa, some communities still uphold some cultural beliefs and practices which are supposed to have been changed had they been subjected to tests and criticisms. 'Igbo' is one of the major ethnic groups in Nigeria, and they are located mainly in the Eastern part and partially southern part of Nigeria. There are some traditional cultural beliefs and practices among the 'Igbo' people that have not been subjected to severe test and criticisms. For instance, 'Igbo' people believe that the 'right hand' of human beings is better than the 'left hand'. Some even see the 'left hand' of human beings as evil. Thus, it is seen as a sign of disrespect or rather a taboo for a child to give something to an elder with the left hand. Some children have received severe punishments as a result of this. It ought to be noted that our knowledge of biology as well as physiology enables us to be aware of the fact that both the 'left hand' and the 'right hand' of human beings have the same components. The only difference is that they are located at different sides of the same human body. The fundamental question is this: What actually makes the left hand bad? If the two human hands are detachable, and the right hand is replaced with the left one; does it become bad when placed on the left side? It seems to the researcher that such cultural belief is baseless when brought to the tribunal of reason, and thus ought to be revisited. It is obvious that some people are prone to be using their left hand more than their right hand.

Also, in some communities in 'Igbo' land, women are generally believed to be inferior to men, and such belief is associated with denying women the right to participate in some activities in the society. For instance, in some communities in 'Igbo' land, women are not allowed to participate in the election of 'traditional rulers'. Such election is the prerogative of men. It ought to be noted that 'traditional ruler' is meant to lead both men and women in the traditional society, and direct their affairs. However, in the civil society, women participate in the

election of state governors and other elective positions in the state. They even contest for such positions.

At every point in time, cultural beliefs and practices should be subjected to criticisms in order to ascertain whether they still worth upholding and practicing. Such attitude brings about cultural development in the proper direction. No culture at any point in time is to be seen as sacrosanct or final. Thus, there is need for anti-dogmatic attitude towards culture. One can also argue that cultural development has no end. It grows and develops continuously. On the level of the individual life, this is closely related to the Socratic maxim that 'an unexamined life is not worth living'. Thus, unexamined cultural practices are not worth practicing. Such examination ought to be continuous, and not just once and for all.

The point to be noted is that no cultural practice is immuned from continuous critical test. Continuous criticisms and revisions of our cultural practices give room for better standard of life. Hanging tenaciously on tradition does not give room for development. Such attitude ends up making people of 21st century to live like people of 4th century despite enormous advancement in education, science and technology.

EVALUATION AND CONCLUSION

The researcher has consistently argued in this article that Karl Popper's idea of scientific development has implications for cultural development, and has actually articulated such implications. Popper's idea of scientific development is based on continuous submission of every scientific theory to critical tests as well as continuous refutation of theories. Thus, the game of science as well as scientific development has to be endless. It could be argued that though Popper's idea of scientific development has implications for cultural development, it is not free from problems and thus, has been subjected to criticisms just like every other philosophical endeavour. Obviously, criticality is a very essential aspect of every philosophic endeavour. Thus, the focus of this section is to evaluate Popper's idea of scientific development. Popper's argument that science develops through the falsification or refutation of the existing theories is quite problematic. The question is this: Will scientific development come to a halt if some theories are not falsified or refuted? It is certain that some scientific theories have not been refuted. This poses serious problem to Popper's idea of scientific development. Furthermore, focusing mainly on criticism as well as refutation of theories turns scientists into fault-finders instead of making positive discoveries. However, despite the shortcomings of Popper's idea of scientific development, it has serious implications for scientific development as demonstrated in this article. It sheds light on what cultural development ought to be as well as the proper direction it should take. It becomes obvious that there is need for anti-dogmatic attitude towards culture. Continuous assessment and revision of our cultural practices give room for better standard of life.

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