

AN APPRAISAL OF POPPER'S THEORY OF FALSIFICATION

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Background: Epistemic Altercation of Knowledge

Modern philosophy highly demands epistemic verification for the establishment of facts or for the claim of truth. Truth that looks always very elusive has also been a continuous issue for epistemic discourse. Truth is built on the knowledge that is verified and certain. And the sense and the culture of verification bring the development of the science and its applications. For the purpose of expatiating the terrain of truth, science came into human quest of development, as Popper will consciously expound that;

The birth of modern science and technology had Bacon and Descartes as its spokesmen. They taught that there was no need for any man to appeal to authority in matters of truth because each man carried the sources of knowledge in himself, either in his power of sense-perception ... or in his power of intellectual intuition.

From this, man has been, in general, preoccupied with the search for knowledge. He must go ahead with the preoccupation of the theories of knowledge to establish the

certainty of such knowledge he claims to acquire or possess.¹ Just to substantiate the above position, Angeles attempts to give a global view of what knowledge is all about through the following definitions:

Recognition of something, familiarity or acquaintance with something from actual experience, that which is learnt. Clear perception of what is regarded as fact, truth or duty. Things had in consciousness (beliefs, ideas, facts, images, concepts, notions, and opinions) that become justified in some way and thereby are regarded as true.²

From this statement, we can deduce that the conception of knowledge or its counterpart truth is far from being as clear-cut as people often imagine.³ A careful reader would have noticed at once that beliefs which are often denounced as non-knowledge is the very first to feature in the above definition of truth. All the same, all human beings desire to know, and truth is the proper object of this desire. Within visible creation, man is the only creature who not only is capable of knowing but who knows that he knows, and is therefore interested in the real truth of what he perceives.

Epistemology as the study of the theory of knowledge provides the platforms for the understanding of the nature of knowledge we acquire. There becomes obviously a grasping of the inner details of the items in question, thereby differentiating between theory and practice.⁴ In a further explanation, central to the problems of epistemology is the definition of knowledge and related concepts such as truth, perception, belief and evidence, the sources and criteria of which each is certain, and the exact relation between the one who knows and the object known.⁵ By so doing, philosophy interprets and gives meaning to their findings. The task of philosophy in this is to provide objective authentic comprehensive knowledge of man.⁶ Knowledge, for science, aims to be proven knowledge, justified by evidence and reason. Nothing is accepted as true unless it has been proved to be so, or there are good reasons to believe that it will be at some point in the future. From epistemology, comes the consideration of philosophy of science. On this basis, we cannot say that good or effective science provides knowledge that will be confirmed as true for all time, whereas bad or

ineffective science yields that have been (or will be) proved false. After all, something that is believed for all the wrong reasons may eventually be proved correct and the most cherished theories in science can be displaced by others that are more effective. What distinguished science from other methods of enquiry is to do with the nature of the claims it makes, and the methods by which it seeks to establish them.⁷ From the reflection of John Paul II on the development of human modern knowledge, he says that;

through philosophy's work, the ability to speculate which is proper to the human intellect produces a rigorous mode of thought; and then in turn, through the logical coherence of the affirmations made and the organic unity of their content, it produces a systematic body of knowledge. In different cultural contexts and at different times, this process has yielded results which have produced genuine systems of thought.⁸

On this, we look at the theory of Falsification in the thought of Karl Popper, who had his background on Logical Positivism as a movement which has transformed the nature of modern and contemporary philosophising adventure. Popper who refuted the works of some of the materialist thinkers such as Hume, Wittgenstein and the likes who placed premium of the matter and neglect the working of the mind or the spirit, advocated for the collaboration of theories. Popper complimented the two natures of being (the matter and the spirit) for the advancement of the philosophy of science and logical reasoning for the establishment of truth or the certainty of knowledge. Ndubuisi, in traditionally evaluating the position of Popper in relation to relativity in positivism, postulated that,

The logical positivists are interested both in the methodology of science and metaphysics. On methodology, they advocate induction as the procedure in scientific research. They, in agreement with this methodology, use their principle of verifiability and confirmability to dismiss the propositions of metaphysics as nonsensical, and as having no bearing in the acquisition of knowledge.⁹

On this, it can be deduced that every research is aimed at arriving at knowledge, but not all knowledge is a product of research. On this, Ogundare observed that;

In the subjectivist epistemology, Popper asserted that there is nothing to show for the certainty or the so-called secure starting point. The starting point, as Popper would argue, is vulnerable and transform the old theory. Popper regards the orthodox epistemology as subjective, and in place of it advocates objective knowledge. This kind of knowledge, he claims, grows by a system of conjecture and refutation. Popper views objective knowledge as evolutionary. In consequence of this, Popper develops his concepts of evolutionary knowledge, according to which knowledge is the product of rational human beings, but which once, created becomes both objective and autonomous, in the sense of having a reality not dependent on individuals' human subjective.¹⁰

With the tone of such ventures, Popper had advanced the nature of epistemic engagements in recent times, because of the marriage of the subjective and objective nature of scientific verification. From the observation by Sosa; it is sometimes taken to be a controversy over whether or not one can identify epistemic properties with “internal” states of believers. Others seem to think that the controversy centres over the question of whether one requires certain sorts of access (or potential access) to the states or properties that constitute having justification. Certainly, paradigm externalists would reject the second clause of the principle of inferential justification.¹¹ Furthermore, Ogundare considered that;

Indeed, the psychological, sociological and political factors relevant to the pursuit of science may be studied. In all these attempts, the philosophical aspect of human problem has been left untouched.¹²

Simply put, these empirical investigation may enhance our description of how people arrive at beliefs about

unobserved facts, but the important questions of whether beliefs arrived at in this way actually constitute knowledge is left open. With the universal consideration, there comes the emergence of a theory. All scientific knowledge must be justified by evidences or good reasons that can stand the test of time. Scientific knowledge is not particular but general, not discriminatory but universal. On the convincing note for the debasement of universal paradigm ascribed to science, Copper & Epperson explicated that;

Many theorists, while claiming to be operating strictly as scientists, make metaphysical or ultimate claims about life. In other words, they clearly reach beyond science and become philosophers. We believe that this is perfectly appropriate if they realise that they have “switched hats” and are now speaking as philosophers. Ultimate statements about what is and is not possible clearly move beyond the limitations of a scientific framework. Science cannot tell us what is beyond science. Nor can it say with any degree of certainty that there is “nothing but” science. Science is simply a methodology. Yet while claiming to be operating in the name of science, some scientists “smuggle in” philosophical assumptions that eliminate from the outset certain aspects of reality. In other words, they justify a philosophical bias in the name of a strictly empirical methodology.¹³

More succinctly, the elimination of certain aspects of philosophical assumptions must seek the establishment of phenomenological and epistemic justification of facts. Ogundare emphasized that;

For Popper, science provides no information whatever about the future, neither has science any predictive import.... General hypotheses themselves do not entail events, but they do in conjunction with statements of initial conditions, the foundation of scientific inference.¹⁴

Naturally, the acceptance of a theory by the scientific community does not thereby guarantee its permanent status, but there are criteria by which one theory may be preferred to

another. Acceptance may often depend on a theory's ability to predict successfully; the more its predictions are confirmed, the greater is its acceptance.¹⁵ Then, it is not a conclusive paradigm for measurement, though very reliable.

Karl Popper's thought on Scientific Falsification

Karl Popper (1902-1994) was an Austrian philosopher from Vienna who, having spent some years in New Zealand, settled in London in 1945, where he became Professor of Logic and Scientific Method at the London School of Economics. He made significant contributions to political philosophy as well as to the philosophy of science. He was an apostle of the account of the Vienna Circle. As a positivist, he championed the cause of philosophy of science and logic with vigour and forceful interest. In his work on *Objective Knowledge*, Popper declared: "our main concern in science and philosophy is, or ought to be the search for truth.... There are excellent reasons for saying that what we attempt in science is to describe and (so far as possible) explain reality."¹⁶ According to Stephen Thornton;

Popper, then, repudiates induction, and rejects the view that it is the characteristic method of scientific investigation and inference, and substitutes falsifiability in its place. It is easy, he argues, to obtain evidence in favour of virtually any theory, and he consequently holds that such 'corroboration', as he terms it, should count scientifically only if it is the positive result of a genuinely 'risky' prediction, which might conceivably have been false. For Popper, a theory is scientific only if it is refutable by a conceivable event. Every genuine test of a scientific theory, then, is logically an attempt to refute or to falsify it, and one genuine counter-instance falsifies the whole theory.¹⁷

Karl Popper's theory of falsification, although important for the philosophy of science, has much wider application. In the 1920's and 30's logical Positivists were arguing that statement only had meaning if they could be verified by sense data. In other words, if you could not give any evidence for a statement, or say what would count for or against it, then it was

meaningfulness. The exception, of course, was statements of logic or mathematics here the meaning is already contained within the definition of the words used. You don't have to go out and point to things to show that $(2+2=4)$. For the interest of the Logical Positivists, that a statement means, is shown by, or somehow consist in the method of its verification. The assumption is that verification must always at least terminate in empirical observation or sense experience. A special exception was made in favour of such analytic formulae as those of logic and maths, which do not require to be empirically verified at all.

More straightforwardly, falsification as used by Popper is a criterion for genuine scientific claims, namely that they should be capable of being falsified on the basis of contrary evidence. In his book *The Logic of Scientific Discovery* (1934; translated in 1959); Popper argued that one could not prove a scientific knowledge to be true simply by adding new confirming evidence. On the other hand, if some piece of sound evidence goes against a theory that may be enough to show that the theory is false.¹⁸ It is difficult to resist the conclusion that there is a fundamental distinction between the external object, if any, that initiates the perceptual process and the perceptual experience that eventually results. This *perceptual dualism* thus raises inevitably the issue of how and even whether the object can be known on the basis of the experience.¹⁹ He therefore pointed out that a scientific theory could not be compatible with all possible evidence. If it to be scientific, then it must be possible, in theory, for it to be falsified. In practice, of course, a theory is not automatically discarded as soon as one piece of contrary evidence is produced, because it might be equally possible that the evidence is at fault. As with all experimental evidence, a scientist tries to reproduce this contrary evidence, to show that it was not a freak result but a genuine indication of something for which the original theory cannot account for.

Popper was particularly critical of the Marxist theory of dialectical materialism and Freudian psychology. He observed that Marxists have the habit of interpreting every event in terms of Marxist theory, and then using such

interpretations to produce more evidence to confirm that theory. He argued that, if nothing were allowed to falsify the Marxist view of dialectical materialism, then that theory could not be genuinely scientific. Similarly, he suggested that a psychologist might be tempted to give a particular interpretation of a patient's condition, based on the accepted theory, and to attempt to explain away or ignore anything which does not appear to fit the theoretical expectation.²⁰ A key feature of Popper's claim here is that scientific laws always go beyond existing experimental data and experience. The inductive method attempted to show that, by building up a body of data, inferences can be made to give laws that are regarded as certain, rather than probable. Popper challenges this on the grounds that all sensation involves interpretation of some sort, and that in any series of experiments there will be variations, and whether or not such variations are taken into account is down to the presuppositions of the person conducting them.

Also, of course, the number of experiments done is always finite, whereas the number of experiments not yet done is infinite, so an inductive can never achieve the absolute certainty of a piece of deductive logic. At the same time, scientists are likely to favour any alternative theories than new, conflicting evidence. In other words, progress comes by way of finding the limitations of existing scientific theories and pushing beyond them. From the consideration by Ogundare; Popper's declaration also has epistemological import. He believed that we can compare two theories and discover that the truth-content of one is more than the other.²¹ It shall come out my explication of Popper's argument of falsification of scientific theories that the appeal of his arguments is not forceful as they seem. Although, we cannot dispense with the place of falsification of scientific theories, if we are to be critical, Popper's advocacy of absolute falsification often called native *falsificationism* is too extreme.

For Popper, all genuine scientific theories had to be logically self-consistent and capable of falsification; an irrefutable theory is not scientific. Popper is

epistemologically convinced that theory (belief) precedes observation which is in turn followed by experiment (testing). When the theory (belief) is repeatedly tested and it is corroborated (i.e. it prove positive) it passes into knowledge. Thus belief passes into knowledge when it is tested and it proves positive. That is a belief that has been tested and justified.²² With this, Popper's view seems to challenge five popular philosophical ideas mostly:

1. Locke's idea that the mind is a *tabula rasa* until it receives experience. Just as R. Rorty also accused Locke of confusing origin with justification, and that instead of Locke to seek the origin of knowledge, he went ahead to seek the how our minds operate in acquiring knowledge. So his thesis is psychological not philosophical or epistemic.²³
2. Wittgenstein's, in the *Tractatus Logico-Philosophicus* (1921), that the task of language is to provide an image of the external world. To Wittgenstein, the world is the totality of facts, the facts are not things. Facts are different from things. Facts have things as constituents, and they are not just the set of these things. But, to Popper, if facts can be subjected to scientific verification and founded testable, they can be referred to as realistic things in term of their physicality.²⁴
3. Berkeley's doctrine of immaterialism. Berkeley's thesis that rejects the concrete existence of physical objects which he also made inferior to the idea in the mind, that, the idea in the mind is superior while the existence of physical things is inferior. It is in line with Platonic thought of the world of form where the real things exist, while the physical world is mere shadow of the former.
4. Hume's doctrine of the refutation and total elimination of all metaphysical, ethical and religious propositions and statements, on the ground that they cannot be subjected to empirical verification for the establishment of their authenticity.²⁵
5. Ultimately on the theory of foundationism as seen in the work of Richard Rorty mostly, which give attempts to establish a basis for knowledge claim that requires no

further justification. To Popper, the already established justification of facts can be considered as evidence for further scientific researches, and that science and technology is endlessly restless.²⁶

These Popper's altercations were on the fact that these above theories or convictions were sectional in analyzing the nature of knowledge, either materially or metaphysically. But Popper considered the emergence of these modes of analysis, their compatibility. It is on the above facts of relevance that Ogundare explicated that Popper's epistemology can be summed up in what he called six 'Ex' of Popper:²⁷

1. Eradication of foundationalism as the search for a secure starting point
2. Extermination of belief philosophy which seeks sufficient evidence or justified belief as grounds of knowledge
3. Elimination of 'truth' as a property of objective knowledge and substitution of verisimilitude in its place
4. Expulsion of dogmatism which is the bane of traditional epistemology
5. Excision of induction from the realm of objective scientific knowledge
6. Establishment of evolutionary approach to epistemology

In all these, Popper saw the human mind as having a creative role vis-à-vis experience. In the scientific realm this means that progress is made when a person makes a creative leap to put forward a hypothesis that goes beyond what can be known through experience. It does not progress gradually by the adding up of additional information to confirm what is already known, but by moving speculatively into the unknown, and testing out hypotheses, proving their weak points and modifying them accordingly. He did not agree with the Positivists that metaphysical propositions are nonsensical and meaningless. But he emphasised the need to demarcate the two, since each of them has a different method of approach. He thus uses falsification as a criterion on demarcation between science and metaphysics. One

important characteristic that distinguishes human beings from other species of animals is the ability to make rational and informed choice.²⁸

From the culture of historical epistemic altercation and reference, Quine positioned that 'belief and valuation are intertwined'. In the belief aspect are the epistemological components of the ability to make rational and informed choices. The epistemological component among others, "involves standards of perceptual similarity: some of these standards are innate, others are acquired".²⁹ Analysing Pantaleonine thought on scientific development in relation to certainty of knowledge via the workability of the mind, Ikhianosime³⁰ asserted that the mutual complementarity of knowledge is expressed as thus: 1. Mind is causally dependent upon matter, and 2. Matter is explicatively dependent upon(required) mind. In scientific analysis, to dismiss the mind is to dismiss the qualitative content of our conscious experience. This is a poor and incomplete explanation of the reality of ourselves and our experiences.³¹ The realisation of matter without the content of the mind in science can fault the reliability of methodology in science. And the content of the mind can be said to be constantly unreliable but progressive. That is the thrust of falsification of scientific engagement. Explicating the intrinsic interplay of spiritual and materialism in human and societal development, Iroegbu will put it that:

For it is a fact about the word that each sensation has its own particular feeling. There is quality of reality in experience. Because feelings are real and therefore more than physical appearance, and eliminative materialism is unable to account for our feeling, it is a poor theory of the mind.³²

As for A. J. Ayer, to make our position clearer, we may formulate it in another way. Let us call a proposition which records an actual or possible observation an experiential proposition.³³ Then we may say that it is the mark of a genuine factual proposition, not that it should be equivalent to an experiential proposition, or any finite number of experiential propositions, but simply that some experiential propositions can be deduced from it in conjunction with certain other

premises without being deducible from those other premises alone.³⁴ In answering extreme materialists like J. J. Smart, who hold that conscious experiences are explainable as brain states and not spirit states, Iroegbu maintained that thought as thought is non-material and therefore cannot be analysed, as would electrons and neutrons. Matter cannot think. Like produces the likes, and so thought, being immaterial, is produced by an immaterial part of man, using the brain as instrument. The brain behind matter is however mind, which is spiritual in nature.³⁵

In effect, according to Popper, the goal of science is therefore to produce propositions which are high in information content, and which are therefore low in probability of being true (since the more information they contain, the greater the chance of finding them to be false), but which actually come close to the truth. It would, of course, be easy to find a statement that never fear been refuted (e.g. "The sun will rise tomorrow), but it offers so little informational content that it is difficult to see how it can be of much practical use. Popper's approach to scientific method was therefore as follows:

1. Be aware of the problems (e.g. the failure of an earlier theory);
2. Propose a solution (i.e. a new theory);
3. Deduce testable proposition from that theory; and
4. Establish a preference form among competing theories.

Therefore, in terms of the results of scientific works, he observed that everything is already 'theory soaked' and is a matter of using and constantly modifying theories in the light of available evidence. In general, science works by means of experiments. Results are presented along with detailed information about the experimental methods by which they have been obtained. The task of those who wish to examine the results is to repeat the experiments and see if they produce identical results. Now, as it goes on, a theory is going to predict facts, some of which will be verified, some of which will not. Where it has failed to predict correctly, it may need to be replaced. However, it is unlikely that a theory will be

discarded at the first hint of falsification. On the other hand, when an alternative theory becomes available, every occasion of falsification leads to a comparison between the two theories, and the one that is confirmed more broadly is the one to be accepted.³⁶

Altercation of Science: Its Rational & Empirical Justification

Popper came to the scene amidst the above unsettling problems to propose a methodology that was both intellectually tasking as well as controversial. His thesis of 'falsification and corroboration' is no doubt very controversial. He posits that at any point in time that a scientist is at work, he is either falsifying or corroborating a theory. And all theories or laws in science, he said, are forever conjectures, as none of them is immune from refutation in the immediate future.³⁷ The issues about the certainty of truth or knowledge claimed can be very difficult to be described or demonstrated, irrespective of the methodology adopted, even science that is mostly rely on or seen to be very hopeful for epistemic adequacy is limited as Popper has seen science refutation of the rational human input.

According to Thompson, science is too vast for any one person to have an up-to-date, specialist knowledge of every branch. Hence the philosopher of science, bring a generalist, is always going to have a problem with doing justice to the latest scientific work upon which he or she needs to comment.³⁸ Even with the doctrines Popper was out to refute, his own seems to all-embracing, but the mind-set of development of human enquiries, we can see that there is no system beyond limitations, scientific verification is an exception, but the marriage subjective and objective models of nature of enquiry it will the most referred methodology for the establishment of truth, as Popper has envisaged. For Morris; relating to the thought of David Hume on the objectivity of science to the falsification theory of Karl Popper. Asserted that "the first species of philosophy looks at humans as active creatures, driven by desires and feelings and "influenced...by taste and sentiment,"³⁹ seeking some things

and avoiding others according to their perceived value. On the part of Francis Offor, with the consideration of the importance of social sciences for the evaluation of human conduct, criticises the tools of science, that, we consideration of the importance of social sciences for the evaluation of human conduct, criticises the tools of science, that, we considered the view that the scientific method is not a suitable model for investigating human-social phenomena on ground of the appreciable difference between the natural and the social science, but rejected such a view as resulting from a narrow conception of the formalist thesis: that every scientific theory, as well as the way it serves the purpose of explanation, must fit into a 'definite logical structure'.⁴⁰ Yet the positive results achieved must not obscure the fact that reason, in its one-sided concern to investigate human subjectivity, seems to have forgotten that men and women are always called to direct their steps towards a truth which transcends them.

On the “classical” analysis of knowledge, the core of the concept of knowledge *is* justified true belief and the foundational structure of knowledge simply derives from the foundational structure or justification. It should be noted, however, that the presupposition that the structure of knowledge parallels the structure of justification is controversial. Indeed, Williamson argued that knowledge is un-analyzable and is a concept that should be employed in understanding a host of other interesting epistemic concepts, including the concept of evidence.⁴¹ The way in which knowledge processes, and especially our scientific knowledge, is by unjustified (and unjustifiable) anticipations, by guesses, by tentative solutions to our problems, by conjectures.⁴² In short, his view is that our evidence simply consists in everything we know. Justification may have foundations but only because we end a regress of justification with propositions that are known the evidential foundation on which all justified belief rests is knowledge.

Evaluative Conclusion

From the foregoing, scientific verification and clarification are endless adventure. In most cases, if not all,

because the establishment of facts gives rooms for further scientific refutation of the facts already established. It is on the fact that theories are our own inventions, our own ideas; they are not forced upon us, but are our self-made instruments of thoughts.⁴³ For Popper will argue that, when you have a choice of theories to explain some phenomenon, you should opt for the one that is better corroborated than the others, is more testable, and entails more true statements. Taking moral fact for an example which is not possibly fixable to be subjected to scientific verification, but it is visibly can establish as real with the use of human numerical logic and rationality. Once there is no possible world in which the judgment is a moral fact. It is this moral fact that moral judgments correspond to in order to confirm their truth or falsity.⁴⁴ Science in the quest of knowledge will developed only when the sense for the theory of falsification is properly internalised, and to embrace it in order to understand the growth of human mind and consciousness.

Popper's thesis, as earlier remarked, is very controversial and in fact, may not be unacceptable to many thinkers, because there are some scientific discoveries and laws that have not been refuted in the course of history, especially those that are rested on the law of nature. In the course of this work, one will appraise this theory of falsification of facts and corroboration of science and metaphysics, because, everything is refutable, if not now, but in the future. Every system is limitation, and no one is a perfect paradigm, even the Popper's theory of falsification and collaboration, is due to his arrival in inductive palace, can be refuted, but for the now remains very much infallible. For Ndubuisi positioned that "Popper's position that theories remain conjectures forever is not acceptable to us."⁴⁵ Critical attitude, as advocated by him, can quite bring progress to science: but our own conception of the dynamism of science is not the context of constant change of scientific theories, as he wants us to believe. But, the conviction that is to be established is a system, theory or fact is relevant within time-frame, that is, every system, theory, or fact is time-bound, which is highly subjected to any possible refutation in the future, irrespective of the conviction it has

convene in the present. The growth in science lies in this culture of refutation and collaboration, without it, science is highly limited.

ENDNOTES

- ¹ C. Bowling, "Panteleon Iroegbu as Academician." In G. Ukagba (ed) *Father Kpim: Philosophy and Theology of Panteleon Iroegbu*. Ibadan: Hope, 2005, pp. 15-34 (19).
- ² Peter Angeles, *Dictionary of Philosophy*. New York: Barnes and Noble Books, 1981.
- ³ Dominic Umoh, "Philosophical Truth versus Religious Faith: a Phenomenological Critique." In *West African Journal of Philosophical Studies*, Vol. 11, 2005, pp. 105-128 (see, p. 111).
- ⁴ Cletus Enwefah, "The Relevance of Enwisdomization theory to Priestly Formation". In G. Ukagba (ed). *Father Kpim: Philosophy and Theology of Panteleon Iroegbu*, Ibadan: Hope, pp. 107-122 (see p. 115).
- ⁵ Z. B. Ogundare, *Epistemology*, Ado-Ekiti: Petoa, 2011, p. 1.
- ⁶ K. Ogundowole, "Man, Philosophy, Science and Technology." In F. N. Ndubuisi (ed). *Philosophy, Logic & Philosophy of Science*. Lagos: Dept. of Philosophy, UNILAG, 2011, p. 135.
- ⁷ Mel Thompson, *Understand Philosophy of Science*. United Kingdom: McGraw Hill, 2012.
- ⁸ John Paul II. *Fides et Ratio*. VC: Libreria Editrice Vaticana, 1998, no. 4.
- ⁹ Friday N. Ndubuisi, *Falsifiability and Corroboration in Karl Popper's Philosophy of Science*. Unpublished PhD Thesis, Department of Philosophy, University of Lagos, 1990.
- ¹⁰ Z. B. Ogundare, *Epistemology*, p. 3-4.
- ¹¹ See, E. Sosa, "Privileged Access." In Q. Smith and A. Jokic (eds). *Consciousness: New Philosophical Essays*. Oxford: Oxford Univ. Press. 2003.
- ¹² Z. B. Ogundare, p. 159. See, K. Popper, "Truth, rationality and the Growth of Scientific Knowledge." In A. Michalos (ed). *Philosophical Problems of Science and Technology*. Boston, 1974 pp. 76-118.
- ¹³ T. D. Cooper and C. K. Epperson, *Evil: Satan, Sin & Psychology*. Mumbai: St Paul., 2008, p. 35.
- ¹⁴ Z. B. Ogundare, p. 265.
- ¹⁵ Mel Thompson, *Understand Philosophy of science*, p. 87.
- ¹⁶ See the Karl Popper's conception of knowledge as quoted in Z. B. Ogundare, p. 122.
- ¹⁷ See, Mel Thompson, *Understand Philosophy of Science*, p. 85, and G. Stefano, *Karl Popper's Philosophy of Science: Rationality without foundation*. United Kingdom: Routledge, 2009.
- ¹⁸ G. Stefano, *Karl Popper's Philosophy of Science: Rationality without*

- Foundation*. United Kingdom: Routledge, 2009, p. 34.
19. M. Huemer, *skepticism and the Veil of Perception*. Maryland: Rowman & Littlefield, 2001, p. 34.
 20. G. Stefano, 2009, p. 50.
 21. Z. B. Ogundare, p. 123.
 22. J. O. Omoregbe, *Epistemology: A Systematic and Historical Study*, Lagos: JERP, 2007, p. 19.
 23. See, Karl Popper. "Conjectural Knowledge: my Solution of the Problem of Induction." *Review International de Philosophie*, Feb. 1-2, 1971, pp.167-197.
 24. O. R. Adeniyi, *The Complementary of Deductive and Inductive Logics*. Unpublished M.Phil Thesis, Department of Philosophy, University of Lagos, 1986.
 25. Though, according to Omoregbe; Hume and popper have shown that scientific knowledge begins with belief and eventually passes from belief to knowledge. The basis of science is induction, and the basis of induction itself is belief- belief in the uniformity of nature, belief in intrinsic connection between two events (the cause and the effect), belief that the future will be like the past, belief that what is the case in instances will be that case in all instances (the inductive leap from some to all). Hume shows in his analysis of the principle of causality (the foundation of induction) that causality (hence induction and modern science) is based on belief (see, J. O. Omoregbe, *Epistemology*, Lagos, JERP, 1998, p. 19).
 26. See, Karl Popper. "Conjectural Knowledge: my Solution of the Problem of Induction." *Review International de Philosophie*, Feb. 1-2, 1971, pp.167-197.
 27. Z. B. Ogundare, p. 203-4.
 28. Gbenga Fasiku, "Moral Facts, Possible Moral Worlds and Naturalised Ethics." *West African Journal of Philosophical Studies*, Vol.11, Dec., 2008, pp.82-102 (see, p. 88).
 29. See, Karl Popper. "Conjectural Knowledge: my Solution of the Problem of Induction." *Review International de Philosophie*, Feb. 1-2, 1971, pp.167-197.
 30. F. Ikhianosime, "The Panteleonine Critique of Materialism and Spiritualism." In G. Ukagba (ed) *Father kpim: philosophy and theology of Panteleon Iroegbu*, Ibadan: Hope, 2005, p. 225.
 31. Panteleon Iroegbu, *Beyond Materialism and Spiritualism*, Ibadan: Hope, 2002, p. 22.
 32. Panteleon Iroegbu, *Beyond Materialism and Spiritualism*, *Ibid*.
 33. A. J. Ayer, *The problem of Knowledge*. London: Cambridge University Press, 1956.
 34. R. Feldman, *Epistemology*. New Jersey: Prentice-Hall, 2003, p. 122.
 35. Francis Ikhianosime, "The Panteleonine Critique of Materialism and Spiritualism". *Ibid*.
 36. Mel Thompson, *Understand Philosophy of Science*, p. 87.
 37. F. N. Ndubuisi, 1990, *Ibid*.

- ³⁸. Mel Thompson, *Understand Philosophy of Science*, p. 88.
- ³⁹. E. W. Morris, "David Hume." In *Stanford Encyclopaedia of Philosophy*, First published Mon Feb 26, 2001; substantive revision Fri May 15, 2009, also on <wmorris@iwu.edu>
- ⁴⁰. Francis Offor, A Philosopher's Interest in the Methodology of the Social Sciences. *West African Journal of Philosophical Studies*, 11(1), 2008, pp. 32-42.
- ⁴¹. T. Williamson, *Knowledge and its limits*. Oxford: Oxford University Press, 2000.
- ⁴². Karl Popper's thought in the Olatunji Oyeshhile, *A Compendium of Philosophical and Political Quotations*, Ibadan: Hope, 1998, p. 163
- ⁴³. Karl Popper's thought in the Olatunji Oyeshhile, p. 163.
- ⁴⁴. Cf, Gbenga Fasiku, "Moral Facts, Possible Moral Worlds and Naturalised Ethics", p. 102.
- ⁴⁵. F. N. Ndubuisi, 1990, *Ibid*.