UNIVERSITY OF CAPE COAST

A JUSTIFICATION FOR THE CLAIM THAT MARXISM IS A SCIENTIFIC THEORY

BY

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DECLARATION

CANDIDATE'S DECLARATION

I hereby declare that this thesis is the result of my own original research and that no part of it or whole has been presented for another degree in this University or elsewhere.

..... Date: .....

MAXWELL OMABOE

SUPERVISORS' DECLARATION

We hereby declare that the preparation and presentation of the thesis were supervised in accordance with the guidelines on supervision of thesis laid down by the University of Cape Coast.

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ABSTRACT

This study is an examination of the scientific status of Marxism. I argue that Marxism is scientific as far as Popper's falsificationism is taken as a serious methodology of science. The method of establishing this finding involves the use of logical analysis to provide a harmonious synthesis between Popper's falsificationism and Orthodox Marxism. The need for the attempt to harness Marxism and science is a direct response to Popper's remarks which seem to pose an unsurmountable threat to the scientific status of Marxism as presented in the *Conjectures and Refutations*. The study examines Marxism's scientific status in the light of the falsificationist criterion of demarcation between science and pseudo-science and concludes that the scientific credentials of the latter is acclaimed by the former and hence Orthodox Marxism ought to be described for what it is, unfalsified scientific theory.

DEDICATION

To Ms. Dora Ahia, Alexander Omaboe, Mercy Vanderpuye and Rose Omaboe.

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CHAPTER ONE

INTRODUCTION

Background to the study

Marxism is a structured body of knowledge named after its major proponent, Karl Marx. Nonetheless, Marxism is faced with huge intellectual controversies. Marxism has been understood in different ways by different scholars. For some scholars, for example, Tucker (1958:130), it is a kind of revolutionary religion. Michael Burawoy (1990) claims it is scientific. Karl Popper, in his *Conjectures and Refutations*, claims it is pseudo-science. For Schumpeter (1994), Marx is a prophet, a sociologist, an economist and a teacher, all at the same time. If there is to be any prospect of success in defining Marxism, then it is prudent to concentrate on how Marx himself defined the core of his work under study. Marxism isolates itself from other bodies of knowledge by its focus on economic factors, human emancipation, and the centrality of its analysis of class struggles, all of which work in the interest of the collapse of capitalism (Burawoy, 1990: 779). There are three basic components of Marxism, namely: dialectical materialism, historical materialism and political economy. These three components have been extensively dealt with in chapter two. However, readers must note that in defending Marxism as a science, our focus is on dialectical materialism, the logical basis upon which stands the Marxian intellectual edifice.

Interesting motivations are responsible for the choice of this topic. First of all, the contemporary economic status quo, the worsening plight of overwhelming poverty stricken population, political crisis and so on are not desirable socio-economic stages one should be proud of. So, the society needs to move

somewhere beyond the status quo. But one cannot just enforce practices merely because one wants to change society for the better. For as Nkrumah (1969:59) says, "Practice without thought is blind"; a theory of clearly defined locus is needed to focus and carry us to a better destination, if not the best. Marxism presents itself as a philosophy fit for executing social change. In the eleventh theses of Feuerbach, Marx (1845) states "Philosophers have hitherto only interpreted the world in various ways; the point is to change it". Marxism seeks to ameliorate the seemingly endemic social, economic and political quagmire across the entire globe. If it promises us better socio-economic prospects, why not give it a hearing?

Before one can change a particular course, one must first understand it. Thus, in choosing the topic under study, I am also motivated by the quest to provide an alternative view to explaining in details some contemporary global challenges. In this sense, Marxism is articulated as a scientific ideology. By "scientific ideology", Marxism differentiates itself from the ordinary label of "ideology". Marx himself will not call his philosophy an ideology. In fact, Marx regards ideology in terms of a body of knowledge that is socially significant, but its significance stems from the distortion of reality by social forces (Carver, 1995: 72). In the *German Ideology,* Marx construes ideologies as illusions of the brain ultimately traceable to material-life conditions. These systems of beliefs which merit the label "ideology" in the Marxist sense, are vampires skinned in sheep dress in order to prevent victims from seeing the damages they cause societies, even whilst they continue to worsen the plight of mankind. Because ideology

draws its identity from the mode of production, its role is to be defensive of and perpetuate the existing mode of production. In short, as emphasized by Marx, "… in ideologies men and their circumstances appear upside-down as in a camera obscura… as the inversion of objects on the retina does [*sic*] from their physical life-process" (Marx & Engels, 2010: 6). Even staunch critics of Marx, such as Popper (in the *Open Society and its Enemies)* admits that Marx's importance has a strong link with the way he focuses our understanding of the society on economic basis. If so, then the will to discovering answers to how society and thinking itself is organized must begin from the doorstep of and not independent of the economic factors under which man is placed. If it is our genuine wish to understand reality for what it is rather than the superficial presentations of the "goodness" of capitalism, then a true picture can be found in Marxism and hence the time to take Marxism serious is now. In line with the submission that Marxism is a scientific ideology, Marxism becomes a visionary system of knowledge meant for the purposes of understanding the social world of work before, if need be, the prosecution of change. Contemporary global challenges are gradually deteriorating. UN statistical record indicates that unemployment rate is expected to rise from 13.3 percent since 2015 to 13.7 per cent in 2017 (a figure which corresponds to 53.5 million unemployed in 2017 compared to 52.9 million in 2015). Even amongst the working population of sub-Saharan Africa, youth working poverty rates globally is almost at 70 percent. What is to be done? Marxism avails itself as a new system of hope. It promises us of human emancipation in terms of equality in social power, wealth, and the overthrow of

exploitation. But before this could be achieved, one needs a framework for understanding the dynamism underpinning the status quo at hand and this can be achieved by shedding light on the scientific basis of Marxism.

As the study pointed out earlier, Marxism has attracted manifold labels; some of which are clearly unwarranted. It has been labelled as science, religion, economics etc. This seemingly wide scope of Marxism has affected its claim to scientific status. Popper (1966:336), for example, arguing from the point of dialectics, has criticized Marxism as sufficiently vague for which reason it is capable of explaining away all of its refutation instances. In *Conjectures and Refutations,* Popper (1962:37) reiterated his commitment to dismissing theories whose predictions are shrouded in vagueness. In the host of academic disciplines, Marxism has to be found a settled place in order to manumit it from the accusation that it is "a jack of all trades" and (hence) master of none. Thus, part of the motivation is to unseat Marxism from unqualified labels and to defend Marxism as science and science alone. The motivation for highlighting the scientific foundation of Marxism intends to give man the adequacy of knowledge required to engineer the social change promised us by Marxism.

Science is a mode of enquiry. It is a well systemized approach by which knowledge is sought. The scientific method, as understood in the modern sense is an errand vehicle of knowledge brought to work at its full capacity by the end of the seventeenth century. Unah (1998:4) has said that a basic way of understanding science is to view it as a kind of research program aimed at gaining knowledge in terms of establishing general laws that direct isolated facts. The scientific method

is characterized by essential ingredients that are aimed at suppressing personal biases that can obfuscate achieving consistent results and objectivity. The core of these essential ingredients include observation of facts, collection of data, experimentation and prediction. Even so, the idea of how these processes have relegated subjectivity from scientific knowledge has not gone unchallenged and Kuhn (1973) is a major contender in championing this course.

The natural sciences: physics, chemistry and biology are distinguished from the social sciences such as economics and sociology by experimentation, rigour and exactness in prediction (Unah,1998: 4). The degree of exactness and rigour determines the margin of error in scientific research works. Natural sciences admit of a relatively smaller margin of error than social sciences. Of the natural sciences, physics and chemistry are regarded as physical sciences. The major background issue is that Marxism has been understood in many different senses; an ideology, philosophy, religion, science etc. The need to foster the promising change Marxism postulates requires prior understanding of Marxism for what it is. For those scholars who have defended the scientific status of Marxism, different methodological philosophies have been employed. Popper says that a page should not be opened for writing without a problem in mind. The difficulty that instigated the motivational anxiety of myself relates to a simple question, “can Marxism, by facing the scrutiny of Popper’s falsificationism, gain entry into the sciences?

Statement of the problem

Many scholars have declared Marxism unscientific. This declaration has come to us by way of several philosophical theories of methodology. The conception of science used in evaluating the scientific worth of Marxism differed according to scholars preferred choice of scientific theory. In Popper's falsificationism in particular, one finds a huge hostility for Marxism as a scientific theory as Popper writes:

> In some of its (Marxism) earlier formulations (for example in Marx's analysis of the character of the 'coming social revolution') their predictions were testable, and in fact falsified. Yet instead of accepting the refutations the followers of Marx re-interpreted both the theory and the evidence in order to make them agree. In this way they rescued the theory from refutation; but they did so at the price of adopting a device which made it irrefutable. They thus gave a 'conventionalist twist' to the theory; and by this stratagem they destroyed its much advertised claim to scientific status (1962: 37).

The belief that this criticism has gained grounds in academic literatures finds expression in Howard's (2002: 7) remark that the challenge of Marxism's claim to scientific socialism lies in the theory's inability to surmount Popperian query. However, Popper in his account of falsificationism failed to narrate comprehensively, a synthesis between Marxian claims and falsificationism for which reason he (Popper) considers Marxian formulations falsified. The problem is heightened when one considers Haag's (1987) claim that Marxists have not been able to provide clear-cut conditions under which Marxism could be said to

have been falsified. In relation to Haag's accusation, one may ask, what then does Popper consider falsified about Marxism? As the quotation above indicates, Popper submits as evidence the social revolution envisioned by Marx as owing up to a falsified instance of Marxism. Yet, there is no elaborate account logically demonstrating how this conclusion was reached anywhere as far as the *Conjectures and Refutations* is concerned. Perhaps, one must consider Popper's condemnation of dialectics as found in his later work, *Open Society and its Enemies*, (1966:336) as providing the needed argumentative basis for his contempt for Marxism as found in the *Conjectures and Refutations.* Nonetheless, could the synthesis of evidence from *Conjectures and Refutations* and *Open Society and its Enemies* suffice to unquestionably unseat dialectical materialism from the latter's claim to scientific status as Popper suggests? The need therefore arises for a re-visitation of Marxist philosophy for the purposes of examining dialectical materialism in the light of falsificationism. This analysis is to make way for the rigorous application of the falsificationist criterion to dialectical materialism in order to really determine the latter's scientific credentials. This is the gap which this study intends to bridge.

Purpose of the Study

There are many academic literatures popularizing the profundity of Marxism. On the one hand, the thesis to be defended (that Marxism is a science according to falsificationism) is meant to aid in the continuous popularization of Marxism, albeit with a specific audience in mind. Karl Marx is usually characterized with the following descriptions: economist, political theorist,

philosopher, and sociologist. These categorizations mean that his ideas have predominantly gained attraction in the humanities. It is high time people with keen interest in science received a note of motivation to study the profound knowledge inherent in Marxism. To inspire this motivation further, the status of Marxism as a scientific body of knowledge needs to be invigorated. By so doing, people with inclined interest in science will now find Marxism as a discipline in their own domain. On the other hand, scientific knowledge has already gained a lot of respect for its worth mainly because of technological inventions. This explains why Haag (1987: 27) remarks that "Marx discovered, however unconsciously, that to be inspiring to our age, one must appear scientific". If so, then to rid Marxism of a scientific tag is to devalue its potency as an inspirational tool for prosecuting social change. It follows that an alternative approach for broadcasting the worth of Marxism is to contract science to cover it. It is in the interest of the above mission that this study intends to motivate Marxism as a structured body of scientific knowledge.

Thesis

Marxism, in this study is dissociated from Popper's charge that it has been enveloped by non-falsifiable auxiliary statements. As such, the position of this study is that because Marxism is falsifiable and not yet falsified, it retains its scientific status regardless of any need of auxiliary statements. Therefore, Marxism continues to remain what it is, a scientific theory. And it finds its place as a scientific theory in the rigorous application of Popper's theory of demarcation: falsificationism. In other words, using Popper's falsificationist

criterion as a measure, Marxism ought to be regarded as a science which has no need for auxiliary statements because it has not yet been falsified.

Methodology and Sources of Information

The method employed in carrying out the study is qualitative. Accordingly, this study shall dwell predominantly on published literatures. Primary articles that cover Marxist ideologies, books, credible news portals and relevant secondary materials form our major sources of information for this study. These sources are critically approached, and with the aid of the tools of logic, arguments shall be developed to support the thesis.

Scope and Delimitation

The scope of study covers two phases in the development of Marxist philosophy. Classical Marxism: the thought expounded by Marx and Engels, and Orthodox Marxism: featuring the era of ideological development immediately following the death of Marx up until Leninism. The designated coverage in the development of Marxist philosophy under the period of review stretches from the latter part of the 18th century to the end of the 19th century.

Significance of the Study

Because the study has audience with interest in science in mind, I seek to break down Marxism so that it could be easily understood by the target group. Beyond this however, the study seeks to clear Marxism from Utopian tags only to make readers aware that the social change envisioned by Marxism is realizable. By establishing the scientific basis of Marxism, the study revives the conditions

(which Popper says have been falsified) necessary for realization of the socialist state envisioned by Marx. Because scientific knowledge imbibes the credential of repetitiveness, I present the scientific basis of Marxism as an encouragement for the proletarians to deal with the variables for the purposes of putting their destinies into their own hands.

Theoretical Framework

The quest to make a case for the scientific status of Marxism ought to be done via an adopted philosophical methodology of science. The need is important for the avoidance of the tendency of oscillating between different conceptions of science. Popper's theory of demarcation rejects the scientific status of Orthodox Marxism. Howard (2002:7) declares that the challenge for Marxism as a socialist theory is its inability to respond to Popperian charge that the theory is not falsifiable. However, the I choose falsificationism in advancing the findings of this study because evidence could be drawn from Marxism to relieve Orthodox Marxism from having to rely on "protective auxiliary statements". This is important because it is in virtue of Popper's so called protective auxiliary statements charge that Marxism gets dismissed from science. Consequently, a synthetization of Marxism and falsificationism is apt to render the latter capable of certifying the scientific status of Marxism: the very theory falsificationism dismisses.

Literature Review

The claim that Marx intends his theory to be scientific is indubitable. This claim, Meyer says, finds expression in the way Marx makes projections about the future that awaits the capitalist society. The projection is that socialism is certainly inevitable (Meyer, 1959:424). Affecting the same side of the issue, Engels' regard for Marxism as a scientific theory is made clear by considering the numerous analogy Engels draw between Darwin's evolution theory and the way Marxism conceives of evolution of the human society. In *Socialism: Utopian and Scientific* (1975:13*),* Engels regards the law that moves society from one qualitative stage to another as the annexation of Darwinian law of survival of the fittest. A similar analogy is drawn between Darwin's discovered law of nature and Marx's law of society as found in Engels' speech at the grave side of Karl Marx. Engels' conviction about the scientific status of Marx is therefore not in doubt. The analogy presupposes that Marxism as a body of knowledge was acquired through the same process used in the acquisition of knowledge in the natural sciences. What remains to be determined is whether the analogy between Marxist law of society and Darwinian law of natural selection suffices to situate Marxism in the biological sciences.

In relation to the debate surrounding the scientific status of Marxism, Burawoy (1990:781) points out two main camps that have evolved. The first camp, Scientific Marxists, concentrates on drawing analogy regarding laws of natural sciences and laws of economic development. The task of the mentioned camp is, in the end, to get Marxism established as a scientific body of knowledge.

The second camp, which he calls Critical Marxists focuses its attention not on the determination of the scientific status of Marxism. Its focus features aspects of Marxist philosophy such as the woes of capitalism, determinism as against freedom, idealism versus materialism and so on. Burawoy regards Marxism as a science. There is no explicit statement about the category of science, whether social science or natural science within which Marxism was placed. However, since Burawoy's responses targeted Lakatos' views about natural science, it is most probable that Burawoy regards Marxism as part of the natural sciences. His basis for judging Marxism as scientific is the very framework by which Imre Lakatos dismissed Marxism from the realms of science. For full appreciation of Burawoy's stance, it is fair to review Lakatos' theory of demarcation.

Lakatos regards two research programs; progressive research program and degenerative research program. According to Lakatos (1989:5), "In a progressive research programmes [*sic*], a theory leads to the discovery of hitherto unknown novel facts. In degenerative research programmes [*sic*], however, theories are fabricated in order to accommodate known facts". Any theory whose predictions are about facts already known or whose statements constitute non testable auxiliary statement is degenerative. Lakatos holds that since Marxism has never predicted any curious fact, it is a degenerative research program. Since a degenerative research program is regarded by Lakatos as unscientific or pseudo-science, Lakatos declared Marxism unscientific. Lakatos' argument is undeniably a valid syllogism. Its logical form could be illustrated as follows:

Premise 1: All progressive research programs are methodologies that lead to the prediction of novel facts.

Premise 2: All scientific theories are progressive research programs. From premise 1 and premise 2, one derives the conclusion: "All scientific theories are methodologies that lead to the prediction of novel facts". Lakatos further claims that Marxism does not lead to the discovery of novel facts. One can infer a conditional statement from the previous conclusion as "If it is a scientific theory, then it leads to the prediction of novel facts". Now, when one adds the premise "It (Marxism) does not lead to the discovery of novel facts to the previous conclusion, one arrives at the final conclusion that "Marxism is not a scientific theory". What remains to be determined is the test of soundness. This is where the importance of Burawoy's contribution to the debate comes into its own. Burawoy (1990) holds that Lakatos' criticism represents inaccurate picture of Marxism since Marxism has been successful in some of its prediction in spite of some explanatory failures. Burawoy points out many features of Lakatos' theory of demarcation which do not warrant a dismissal of Marxism from the sciences in the way that Lakatos concluded. Lakatos, in his *Method of Scientific Research*, holds that "hard cores" of a theory develop over a long period of time with intermittent successes and failures. On this basis, Burawoy finds support for Marxism as a science. The implication is that if any of the predictions of Marxism fails, it is to be taken as part of the necessary condition leading to the establishment of the hard core of Marxism. Burawoy's approach in defending Marxism is important because this study shares the style but not the content of his

work. Burawoy used Lakatos' theory which was dismissive of Marxism as a science to uphold the scientific status of Marxism. This study seeks to do same, the difference is that the theory to be used this time is Popper's falsificationism.

Tucker (1958) discusses at length the concept of alienation in Marxism. In his writing, he notes that Marx dismissed a religious approach in favour of a secular approach for the redemption of man. To this end, man, Tucker holds, must destroy his exploitative environment that sets him up as an alienated entity. The destruction of this society fraught with exploitation is seen by Tucker as a kind of political revolution intended to initiate man as a born again being. Here, "born again" indicates transformation from a divided self of alienation to a harmonious whole. Tucker regards this kind of transformation as expression of religious revolution. Tucker's conclusion is that such a philosophical worldview (the view represented by Marxism) is not a scientific body of knowledge; at best, it could be regarded only as a secular creed. It is important to note that by focusing on Marxist concept of alienation, Tucker's classification of Marxism (as unscientific) is worked out through political economy. His perspective of analysis still leaves room for some study to be done. His declaration of Marxism as unscientific is an upshot of analyzing one component of Marxism, political economy. This is why it is important for this study to work out the status of Marxism from the core component of Marxism, namely: dialectical materialism.

The analysis of the scientific status of Marxism has also been offered through the lenses of political economy by Anthony Kenny. Kenny (2010) highlights some detailed analysis of Marx's *Das Capital,* explaining the

extraction of surplus value from the proletariat classes. He holds that the continual advancement in technology leads to increase in productivity. Because technology provides a comparatively higher level of efficiency as compared to work done manually, the value of labour continues to get marginalized and the amount of labour's productive effort expended in the production process attracts less and less wages. As the exploitation approaches its climax, proletariats grow intolerable attitudes, revolts become inevitable, and ultimately class system is dissolved by the institution of communism. Kenny regards Marx's account of the transition of society just spelt out above as having demonstrated philosophical insight, albeit a distant account from predictive scientific theory. Kenny writes that it is Marx's wish that his predictions about the development of societies be considered scientific. However, says Kenny, If Marx's predictions were true, the said revolutions should have occurred sooner than later in technologically developed countries. It is worthy of note that the use of analysis relating to political economy as the only basis for explaining the predictive successes of Marx is inadequate because exploitation would have been considered as the only necessary factor for ushering societies into a revolution. The full details of the requirement for a revolution is not only found in exploitation of proletariats alone. In Engels' letter to Joseph Bloch (2000), the point is well emphasized that economic factors are not the only determining causes of social change. Even though the economic factors are the most decisive one, Engels made room for some roles to be played by the superstructures as well. Most importantly, this is a further indication that the determination of the scientific status of Marxism has

had attention from a limited focal point, at least as shown by Kenny's thought. This gives an opportunity for further studies that do not only focus on one component of Marxism but the logical basis of Marxism itself, which the I have identified with dialectical materialism.

Haag (1987) is unequivocal in his dismissal of Marxism from the realm of science. He holds that Marxism feigns scientific status in order to inspire followers or those from whom it seeks audience. His basis for dismissing Marxism betrays a conception of science he has in mind. A close look at his criticism shows that science for him is about generating true information about the phenomenon the method seeks to study. Popper, whose position I shall review later, will not agree with Haag in relation to the conception of science raised. Haag points to some of the core claims of Marxism, which he regards to be false, as sufficient basis for showing Marxism as unscientific. Some examples deserve to be cited here. In the first place, Haag alludes to the Marxist claim that class membership is the most decisive factor in determining almost every political action. He again mentions that Marxism predicts a continuous worsening plight of the working classes right from the inception of slavery till the dawn of socialism. Marxism also makes mention of the idea that the history of a society is conditioned by economic forces. Haag's position is that the first two factors are false whilst the last factor is an exaggeration of the role played by economic factors as that which determine the dynamics of historical change. The point at which this study departs from Haag's effort at showing Marxism to be unscientific is the conception of science to be used in this study. This study

intends to uphold the scientific status of Marxism through the lenses of the falsificationist criterion and not from the analysis of truth value as expressed by the concerns of Haag.

Karl Popper (2002) rejects induction as a rational basis for scientific enquiry. In place of induction, Popper, opts for deduction. The Hypothetico-deductive method of enquiry has already been proposed by Chauncey Wright (Graybosch, Scott & Garrison, 1998: 169). But it cannot be denied that Popper is a famous advocate of its popularization. By this method, Popper admonishes the scientific community not to pursue instances of confirmation in order to prove a hypothesis. For him, hypothesis must constitute premises from which other falsifiable statements are deducible. If the falsifiable statements are shown to be false by any observable circumstances, the theory admits disqualification from the corpus of science and gains admission into the history of science (Verikukis, 2007:10). However, if it is able to stand any observable test meant purposely to refute the theory in question, then it has been corroborated. A corroborated theory is not one that is true necessarily, it only means that the theory has been able to stand the test of time until further notice (Popper, 2002:12). In his book, *Conjectures and Refutations*, Popper (1962: 34) reiterates his commitment to the falsificationist criterion according to which one of the most overt condemnation of historical materialism from scientific status is upheld. By "unscientific", Popper means theories that are incomparable with physical theories like Newton's theory of relativity. In conformity with the falsificationism principle, Popper's contention against Marxism is at two levels. On the one hand, the earlier

formulation of historical materialism gives rise to predictive consequences that were actually falsified. This predictive consequence was the anticipated revolution envisioned by Marx. On the other hand, the very attempt to rescue the theory resulted in auxiliary statements that shielded the theory from testability. Not that auxiliary statements are anti-scientific but they count only when they expand the chances of the theory under the test of falsificationism (Loose, 2001:153). Popper holds that the epistemic enterprise only admits of theories as scientific if testable consequences can be deduced from the theories in question. Test, as Popper had in mind, is not any mere observable instance but a rigorous designed procedure meant to refute the theory. This yardstick which forms the cardinal virtue of a theory worthy to be labeled scientific is what historical materialism lacks, says Popper. In Burawoy's (1990:3) comment, Popper's contention finds a succinct expression: "According to Popper, Marxists pursued confirmations of their theories rather than establishing criteria for their falsification. Marxism, like psychoanalysis, could not be proven wrong and therefore could not be a true science".

The various responses to Popper's falsificationism criterion in relation to Marxism are rather interesting. Hudleson argues that the charge levelled against Marxism affects only historical materialism to the exclusion of political economy (Verikukis, 2007: 4). Other scholars such as Cornforth (2015) has attempted to rescue Marxism by pointing to some inconsistencies and logical flaws in the way the falsifiability criterion applies to Marxism. However, the burden of proof is not directly discharged by these defendants. Conforth's attempt in rescuing Marxism

empowers a good start and forces us to re-examine the compatibility of Marxism and falsificationism, which is why further studies like this is important. What is needed at the moment is an academic momentum intended to harmonize Marxism and falsificationism.

The criticism levelled against Marxism by the falsification criterion is directed specifically to historical materialism. In the same book, *Conjectures and Refutations,* Popper has another problem with dialectics which when taken seriously has an important bearing on the scientific status of Marxism. Here, Popper draws a comparative analysis between falsificationism and dialectical thinking. He thinks that the result of this comparison does not permit one to grant dialectical reasoning any scientific status using falsificationism as a criterion of demarcation. To sum up this disanalogy, Popper holds that in dialectical thinking, competing thoughts, thesis and antithesis are synthesized as a newly formed thesis. However, in the application of falsificationism as a theory that explains scientific progress, the rivalry between competing scientific theories, call them thesis and antithesis does not lead to synthesis but a complete overthrow of one by the other. Perhaps, Popper's most severe attack on Marxism relates to his criticism of dialectical reasoning, according to which dialectical reasoning is entirely a useless process of knowledge acquisition. Popper holds that since any statement can validly follow from the assertion of contradictions, dialectical reasoning (which upholds the validity of contradictory assertions) can give rise to unwarranted conclusions. This criticism is adduced from the position advanced by Marxists and Hegelians, which regarded contradictions as real existential forces at

work. It takes little familiarity with propositional logic to realize how convincing Popper's criticism of dialectics is. From the premises "This is a bag" and "This is not a bag" any conclusions at all can validly be inferred, even a conclusion as absurd as "This is not a substance at all" (Copi & Cohen, 2000). In the *Open Society and its Enemies,* Popper (1966:336) identifies the problematic nature of assertions that involve a contradiction as the source of the vague predictions of Marxism, which are incapable of being falsified and hence unscientific. The way out is to renounce the law of contradiction or reject dialectical reasoning as false, with Popper opting for the latter. However, the application of dialectical reasoning to society implies that the proletariat and bourgeoisie are (at least one of the) contradictory existential classes. This view has not gone unchallenged. Copi and Cohen (2002) argues that the said analysis which construes the class of bourgeoisie and proletariats as contradictions is inaccurate. Copi and Cohen maintain that these classes are in fact not contradictories. If Copi and Cohen are right, then what Popper regards to be the assertion of contradiction in Marxism ought to be put in proper perspective. And until this controversy is reasonably resolved, I submit that the onus of proof has not been fully discharged by Popper's analysis of Hegelian and Marxist dialectics. The contribution of this study intends to vindicate the bourgeoisie and proletariat classes to be some existential variables other than contradictory classes. And if falsificationism can cover other scientific theories that involves such variables, then falsificationism should be able to accommodate dialectics as well.

Sheehan (1993:23) regards Marxism as indeed scientific. She holds that Marxism extended the scope of Darwinism to incorporate a new way of thinking about nature. That is, the implications of Darwinian theory of evolution are made applicable to social relations by Marx and Engels. Marxism itself was inspired by great advances made in the natural science and as such, materialism as a philosophical thesis needed to also be brought on a par with the new development in the sciences. In her view, it was therefore not surprising that Marxism emerged around the same time that Darwinism had made a profound headway in explaining the evolution of biological systems. Sheehan's views have stunning consequences that need thoughtfulness. First of all, her discussions are tilted towards showing Marxism as part of the biological sciences even though no explicit mention of this clue is ever made unequivocally. This claim falls on the evidence of incessant mentioning of the influence of Darwinism on Marxism. Just as mutations happened on the basis of genes adapting to their environment for survival, so do societies change on the basis of the way societies are organized in terms of the production and distribution of the basic needs of the people for survival. The construal of Marxism as an extension of the boundaries of Darwinian theory of evolution presupposes that as a body of knowledge, Marxism is itself vested with scientific credentials. Secondly, Sheehan's position indicates that Marxism is part of the life sciences, natural science for that matter.

In Kuhn's work, *Structures of Scientific Revolution*, three stages of science are identified; pre-science, normal science and revolutionary science. Kuhn holds that these three stages of science that characterize the history of science actually

falsify the falsification criterion of Popper. Kuhn disagrees with Popper's claim that the mark of scientific progress is the logic of falsificationism (Loose, 2001:199). Kuhn further claims that what characterizes science as a method of enquiry is the stage designated as normal science. Normal science is that stage of enquiry where a problem presents itself in a way that requires the ingenuity of the scientist. If the proposed solution fails, it is the enquirer, not the method of enquiry that has failed. It is the researcher's intelligence that is first called into question because the method available for use in solving the problem is well accepted by the community of scientists. The scientist has to undergo a conceptual analysis of the problem again, as well as readjustment of his tools. This established methodology of problem solving is called paradigm and the problem to be solved at this very stage is called a puzzle. In the face of abundant anomalies with respect to the application of the paradigm to a puzzle, the integrity of the paradigm now comes to be questioned. Ultimately, as anomalies keep amassing, the paradigm is overthrown by a new set of paradigm, which now assumes the era of normal science again awaiting future anomalies. The cycle continues. Now, is Marxism presented with any puzzle solving opportunity? Obviously Marxism, like any other theory aspiring for the label of science is at times confronted with challenges which seem to cast doubt on the efficacy of the theory with regard to offering satisfactory explanations. For example, the idea that the rise of capitalism will first foreshadow backward countries failed as worked out by Trotsky. In his work, *Logic of scientific discovery or Psychology of Research,* Kuhn points out that if the problems facing the paradigm in question

present resolutions beyond the researcher's knowledge, control or responsibility, then such problems are not puzzles in the sense explained earlier. And without a puzzle to solve, there is no science. According to Burawoy (1990:786), Lenin's approach in dealing with the anomaly facing Trotsky was to reinterpret the anomaly into a corroborated view under Marxism. On this note, Kuhn is on the same side in ruling out Marxism from scientific status, he only differs from Popper in terms of the reason why. While Popper thought that beyond Marx's own formulations, Marxism is not open to falsification, Kuhn's prescription of puzzle solving as the core defining principle of science denies Marxism the entry into the realms of science.

The remarks of Paul Feyerabend (1993), in his work *Against Method,* has interesting relations to Marxism. Feyerabend opposes methodological rules in conducting any research worthy to be labelled scientific. Two main reasons are offered by Feyerabend for his stance. Firstly, this is a vast world of which one knows very little about. Thus any method that seeks to extend our knowledge of the existing corpus of scientific knowledge should be welcomed. Secondly, he argues, allowing strict methodological rules to govern science is not humanitarian because it stifles individuality, liberty to free thinking, and personal ingenuity. Thus Feyerabend endorsed methodological anarchism as the way to ensuring scientific progress. The "flood gate" opened by the lack of restraint for what should pass as science has straightforward implications for Marxism. Marxism passes as an important body of knowledge in the light of Feyerabend's methodological anarchism. In fact, Feyerabend is of the view that scientific

knowledge should not be accorded any revered accolade in our quest for seeking knowledge about the world. The source of knowledge given by science is not worthy of any deep respect as opposed to other modes of knowledge enquiry (Couvalis, 1997:112). By way of inference, Feyerabend will have to agree that the worth of Marxism as a structured body of knowledge relevant to the development of societies is unaffected by debates about Marxism's scientific status. However, the need to show Marxism as a scientific theory has also the capacity to widen the scope and audience for the discipline, as against the conventional characterization of Marxism as revolutionist ideology or a religious dogma.

Wiredu grants scientific status to Marxism albeit with a serious reservation. For him Marxism is scientific only in principle. This means that Marxism is a coherent abstract body of knowledge that can be analyzed according to the provision of science. He holds that when it comes to practice, Marxism loses its scientific credentials. He writes, "In the socialist, or more strictly, communist society dreamt of by Marx……where in the world, I ask, is there any form of social organization remotely resembling this ideal picture? (1980:90). In short, Wiredu thinks of the projections of Marxism as unrealizable state of affairs. Far from analyzing the question of demarcation from whether the body of knowledge in question is an achievable state of affairs or not, falsificationism is adopted as a methodological standpoint to show the scientificity of Marxism. Does Orthodox Marxism lend itself to refutation? What matters in the end is that Marxism can discharge the burden of proof by answering the question in the affirmative.

Vaillancourt (1986) is of the view that dialectical reasoning is a helpful tool in social science research programs. He held that well systematized dialectical reasoning, when applied to the study of concrete object becomes very consistent with scientific research and empirical studies in general. He recommended that dialectical reasoning ought to be reevaluated in concrete and materialist conception. He concluded that when this is done, dialectics could have very important contributions in social science. From my point of view, Marxism is to be considered scientific given that the application of dialectics in concrete studies already finds expression in the materialist conception of history as theorized by Marxism. In this study, if Marxism is to be established as scientific, it is not because dialectical materialism could extend its explanatory successes into studies about concrete objects. It is because the logical foundation of Marxism, dialectical materialism, could withstand the test of falsificationism.

In a very recent article *Why Marx Was Wrong* published on the 9th of May 2018, Bildt's judgmental commentaries of which dialectical materialism is the target, boarders on the scientific status of Marxism and hence deserves treatment here. Bildt drew Marxian deductions from dialectical materialism and submitted that the abolishing of private property, as Marx holds, is the source of all evil and that society can only be harmonized at the disposal of private property. Commenting on this deduction, Bildt holds that such a conclusion is not only a dangerous propaganda but also a wrong theory. At least one main example is cited as evidence of this claim. Bildt proceeded with the example that regimes which rejected capitalism in favour of communism (with specific reference to China)

have failed. Consequently, he alludes to Popper and calls Marx a "false prophet". Similar sentiment has been expressed by Peter Singer who held that China's economic decline following the adoptation of Marxism, and the consequent amelioration of the economic woes of the same country after the proliferation of private property ownership give clear indication that Marx's predictions, in Singer's words, "have been falsified, his theories discredited and his ideas rendered obsolete". Our major interest in this review is that Marxism is subtly declared scientific, albeit, one that has been falsified. This is because if Marxism is wrong as Bildt and Singer want us to believe, then the implication is that Marxism does offer itself to be tested and hence falsified. Consequently, either one abandons Marxism as part of the history of science or demonstrate that it has not been falsified. In this study, Popper's own theory is intended to serve the theoretical framework by which the latter disjunct will be pursued.

Some commentary is required to summarize the review. There are numerous attacks challenging the scientific status of Marxism. Few of these attacks are directed to specifically dealing with dialectical materialism. Again, among scholars who tend to grant that Marxism is a science, there is the absence of a synthetization attempt to harness the methodology of science in question Marxism in particular. In the pool of available studies conducted so far, there is room for further studies to deepen dialectical materialism for the purposes of reasserting the scientific status of Marxism. By so doing, Marxism is bound to be accredited by science without any ambiguity about its place within (the) academic

disciplines. As regards the unambiguously well settled place, this study envisions that Marxism is indisputably a scientific theory.

Organization of the study

Chapter one of this thesis covers the introduction. Chapter two espouses the core claims of Marxism and how they aid our understanding of the world and human society. Chapter three puts up a defense for Karl Popper's criterion of demarcation, falsificationism. Chapter four deals with a synthesis of Marxism and falsificationism: A proof of the scientific status of Marxism. Chapter five reaffirms the thesis that Marxism is a scientific theory.

CHAPTER TWO

CORE CLAIMS OF MARXISM AND HOW THEY AID OUR UNDERSTANDING OF THE WORLD AND HUMAN SOCIETY.

The core claims of Marxism revolve around the following themes: dialectical materialism, historical materialism and political economy. In this chapter, two things are aimed at. First, I discuss dialectical materialism in detail and explains why it serves as the best foundation for scientific theorizing. The reason our main attention shall be on dialectical materialism is simple; the study submits that the scientific status of Marxism is based on dialectical materialism, the true law governing social reality. Its truth status as a social law is to be found in Popperian correspondence of truth wherein truth is measured according to its correspondence to the reality it seeks to describe (Popper,1962:231). Second, the study shall look at historical materialism: the application of dialectical materialism to the development of human society.

The Logic of Dialectics

The fisherman cannot pick out fishes at sea without some prior knowledge of what fishes are not. His success depends in part on how well he is able to discriminate the concept of fishes from non-fishes. As cognitive subjects, our first point of call in understanding events and the world around us is to think about those events and the phenomena in question. The process of thinking devoid of good framework could distort our grasp on reality. Three basic laws: the law of non-contradiction, the law of identity and the law of excluded middle, among

others form the core basis of formal logic. They derive their status as fundamental laws of thought to the extent that all general truths of science are deducible on the assumption that these fundamental laws are true in the first place (Boole, 2017:3). All these laws are challenged and reformulated by dialectical thinking. In fact, the need for dialectical thinking is anchored upon the appreciation of the limitations of formal logic, which enjoyed unrivalled supremacy for over 2000 years since Aristotle first formalized them. The point is succinctly summarized in the following words: "Then dialectics arose out of the criticism of formal logic, overthrew and replaced it as its revolutionary opponent, successor and superior" (Novack, 1991:18). The declaration from Engels reads:

> Even formal logic is primarily a method of arriving at new results, of advancing from the known to the unknown - and dialectics is the same, only much more eminently so; moreover, since it forces its way beyond the narrow horizon of formal logic, it contains the germ of a more comprehensive view of the world (Engels 1996:95).

I argue that dialectics does not overthrow formal logic. Dialectics is an extension of formal logic to explain reality in a way that the laws of formal logic are handicapped. It broadens the application of formal logic in a way that better explains social phenomenon. Accordingly, an expatiation of dialectics must do well to include an understanding of its inferior half: the fundamental laws of formal logic. These laws include the law of non-contradiction, the law of identity and the law of excluded middle.

The Law of Non-Contradiction

In the *Posterior Analytics,* Aristotle, who is credited with the systematization of the law of non-contradiction defined it as "an opposition of which its very nature excludes a middle. In the *Metaphysics*, the same law is formulated as, "…It is impossible for the same attribute at once to belong and not to belong to the same thing and in the same relation." (1005b19-20), and at (1011b13-14) he says, "That the most certain of all beliefs is that opposite statements are not both true at the same time". In both assertions, Aristotle's claim is that contradictory propositions cannot both be true and false as far as the same relation affects the same time. The law is simply formulated as A is not equal to non-A. Aristotle holds that the law of non-contradiction is the most fortified law that governs reality (Tahko, 2008:26). Formal logic since Aristotle, therefore, has denied the actual prevalence of contradiction, restricting its existence to thought alone. And even in thought, formal logic requires one to take contradiction as a sign of error, and hence it should be eliminated. Marxian and Orthodox dialectics oppose the validity of the law of non-contradiction as a basis for describing the way things actually are. If the law of non-contradiction is annulled then what is expected to follow is that A = non A, that is black is equal to non-black. Non-black here does not specifically refer to blue, red or any specific colour available taken singularly. It comprises the set of all available colours in the world, even ones not yet discovered, to the exclusion of black alone. This is the result of denying the law of non-contradiction in relation to the traditional construal of the term (Carver, 1995).

Orthodox Marxism reinterprets the classical notion of contradiction with the view that in the fabric of social life, contradictions are real. Engels (1996:86) held that contradiction is interwoven into the fabric of the universe. He adduces evidence for the reality of contradiction from mathematics, as straight lines are equated with curves under certain conditions as far as calculus is concerned (1996: 85). It is important to note that Engels' construal of the law of non-contradiction in Marxian terms encompasses an extended meaning beyond the limitation of Aristotelian rendition of the term in question. Some examples may be of help. Engels (1996:19) holds that "Further, we find upon closer investigation that the two poles of an antithesis positive and negative, e.g., are as inseparable as they are opposed and that despite all their opposition, they mutually interpenetrate". The notion of "positive" and "negative", just like the mathematical provision of straight line and curved lines (which he deemed contradictions) are not contradictions, for there are intermediaries between straight line and curved lines, just as there is a neutral point between positives and negatives. The existence of intermediaries is suggestive of the idea that, both supposed contradictory statements can be false. But as provided by Aristotelian scheme of non-contradiction, contradictories cannot both be false. Engels made special mention of Heraclitus as a prominent figure in ancient Greek scholarship to have expressed a naïve but clear conception of dialectical thinking. One would have thought that the idea of contradiction would have therefore found a more concise articulation in Engels. Engels attributes to Heraclitus the claim that all things are and are not, that things are in perpetual flux, that things are coming into being and going out of existence (Engels, 1996).

Heraclitus' claim that things are and are not is a succinct articulation of contradiction, however, his subsequent examples, like that of Engels are far-fetched. Heraclitus' examples of which few shall be cited here indicate a special relation between pairs at variance. He holds, "The path up and the path down is one and the same", "Sea is purest and most polluted water; for fishes it is drinkable and salutary, but for men it is undrinkable and deleterious etc. (Kirk, Raven & Schofield, 1985:188). The upward path and the downward path can both be false, for example if some determined limits by which one can measure middle grounds do exist between the extremes. Again, drinkable and undrinkable water with respect to fishes and humans can both be false if the water contains elements hazardous to both human and fishes. Heraclitean concept of the opposites essentially expresses the relation of contraries not contradictories. Accordingly, unless one ascribes to Engels an unthinkable level of inconsistency, it is implausible to interpret Engels' notion of contradiction as falling victim to his own criticism of Heraclitus. In his writing, *In Defense of Marxism,* Trotsky (1942:54) is like Engels and Heraclitus in the sense that Trotsky expresses a conception of contradiction that deviates from Aristotelian construal of the law of non-contradiction. Trotsky's example relates to how an object could measure different weights according to improvements made in the scales used. However, the difference in the weight of an object according to two different scales does not translate into the claim that A is non-A. The reason being that the contradiction of 5kg is not 6kg or 8kg but the set of all of counting numbers excluding 5kg. But if the Aristotelian notion of contradiction is what Trotsky had in mind, then one

pound is at the same time equal to all measurements of kilograms with the exception of one pound. This is very counterintuitive and perhaps disingenuous. But this is the conclusion that one can reach if one grants that Trotsky and by extension Engels intended using the term "contradiction" in the Aristotelian sense. But even more important, Carver (1995) avers that Marx had dismissed some claims of Hegel and Mills on the basis that such claims overtly fly in the face of the law of non-contradiction. In the light of this evidence, it is disingenuous to hold (unless one claims that Marx is inconsistent) that dialectical materialism opposes and overthrows the very basis (the law of non-contradiction) by which Marx rubbished the claims of Hegel and Mills. Again Marx holds that division of labour establishes a contradiction. By contradiction, he meant an opposing interest of the self against the common interest. In other words, Marx used contradiction in reference to opposing forces that cannot cohabit at the same time unless both forces submerge to give way for the prevalence of a new force. In contemporary philosophy, Havey (2002) has made the point that the contextual application of dialectics as used by Marx does exclude the sense in which Aristotelian rendition of contradiction applies. For him, Marxian notion of contradiction relates to internal relation of forces pulling in opposite direction. In the *Grundrisse* (2002) where Marx incessantly employed the word "contradiction", there is ample evidence that his intended notion of contradiction is not Aristotelian. For example, he described the character of money as contradictory because "it must represent value as such; but represents in fact only a constant amount of fluctuating value. It therefore suspends itself as complete exchange value" (2002:174). Nonetheless the

constant fluctuation of value and real value are not contradiction in the sense in which one would say A is contradictory to non-A.

It has been witnessed that if one suspends the law of non-contradiction then its consequential bearing on the understanding of reality is very counterintuitive. It has also been highlighted that even Engels employed examples that do not depict the meaning of non-contradiction as theorized by Aristotle. One is led to the conclusion that there are two kinds of contradiction: The Aristotelian sense and the Orthodox Marxian sense. The latter, which has been attributed to Orthodox Marxism is a necessary consequent of the principle of charity. The principle of charity requires that in interpreting an argumentative text, the interpreter must assume that the arguer is intelligent. By so doing, the interpreter should search and ascribe to the arguer only those points that are argumentatively strong. All weak arguments are expected to be treated as explanations not as arguments (Black, 2012:127). Based on the principle of charity, one must suppose that Orthodox Marxists were intelligent, and did not even intend to apply the law of non-contradiction in the Aristotelian sense. The application of this principle finds support in *Anti-Duhring*, where Engels holds that contradiction is not a mere denial of an affirmative proposition, but any kind of overriding a limitation in which the thesis is dissolved into a new thesis also constitutes a contradiction (1996, 99). According to this emendation, some peculiar relationship between two entities passes to be considered as contradictions as expressed under the new formulation. The analysis is completed with the following categories as examples: (i) black and non-black (ii) black and white. Category (ii) suffices to

pick out the Marxian construal of the law of non-contradiction. However, category (i), which represents Aristotelian conception of non-contradiction is not invalidated as a law of thought by the Marxian approach. Engels (1996:20) claimed that "Nature is the proof of dialectics…". And how could this truth be demonstrated as false if not finding a contradiction between nature and the suppositions of dialectics? If so, then it is utterly impossible to prove the truth of dialectical materialism without somewhat approval of the validity of the Aristotelian law of non-contradiction. Marxian use of "non-contradiction" therefore, is to be understood as a stipulative definition. A stipulative definition assigns a meaning to a term independent of its conventional usage (Layman, 2002:98). It is therefore unfounded to suggest that Marx advocates for outright annulment of the law of non-contradiction as concerns Aristotelian formulation. Perhaps, it was Marx's conviction that the Aristotelian sense of the law of non-contradiction has limiting effect in producing useful knowledge when it comes to studying human society. Dialectics does not seek to undermine the truth of the law of non-contradiction. Dialectics is therefore extended to cover forces of opposition as well, especially as it applies to social reality.

One of the most crucial challenges that have been posed to dialectical thinking relates to how dialectics allows propositions of all kinds to be validly deducible from it. This has been pushed forcefully by Popper (1962) in his work, *Conjectures and Refutations.* Here the problem is only illustrated and is addressed later. Let us suppose that the proposition (i) "All bags are white" is true. Its contradiction would therefore be (ii) "This bag is not white". It is important to

note that the relationship that is picked here by Popper to represent the principle of non-contradiction is strictly Aristotelian. Let us symbolically present the two propositions, replacing (i) with W and (ii) with –W. From the presentation, premise (1) reads W • -W (where "•" stands as the logical connective for "and"). From Premise (1), the logical rule of simplification can be invoked to warrant the deduction of a premise (2): W. From premise (2), one can deduce a new logical relation constituting premise (3) on the basis of addition: W v Q, (where v stands for the logical connective "or" an Q is any statement at all). From premise (1), the rule of simplification can warrant a premise (4): -W. From premise (3) and (4), the application of disjuctive syllogism leads us to infer Q. Since Q can be taken to be any proposition at all, critics hold that any proposition can validly be inferred from contradictory statements. Popper's contention presupposes that the unrestrained generation of valid propositions from contradictions is the source of all the auxiliary statements that tend to shield Marxism from being falsified, and hence, rendering Marxism unscientific. McTaggart (2000) presents the problem in another simple fashion. Without the law of non-contradiction, logical discourse is not possible. This is because the refutation of a claim requires establishing other true claims that are incompatible with the claim in question. However, if two contradictory propositions are regarded as a mark of truth rather than error in reasoning, then nothing could ever be said to be true, because whatever claim is incompatible with the claim in question proves nothing and hence, no claim can be said to be false. Under the suspension of the law of non-contradiction, no logical room is available for the falsification of any proposition, whatever this

proposition may assert. It seems that without the law of non-contradiction, language is good for nothing, for it is trapped in passing all absurdities, and yet none of the passed absurdities could ever be granted as true, not even as false.

Marxism, I argue, does not deny the veracity of the law of non-contradiction. This shall be dealt with later again in this chapter. The little to be said about it is that Marxism reinterprets the law of non-contradiction in a way that can help us understand the dynamism underpinning the reality of social change. The application of the Marxian stipulative definition regarding the law of non-contradiction yields one of the dialectical laws of social change: the law of interpenetration of the opposites (Engels, 2001:18). The crux of this law is that opposites are not only harmonious; their interaction is necessary for the existence of social reality (Lewis, 1982).

The Law of Identity and The Law of Excluded Middle

The law of identity follows directly from the law of non-contradiction. If A is not equal to non-A, then from the application of double negation, one arrives at A equals A. In other words, the principle suggests that if it is true that A, then A is true (Copi & Cohen, 2002). All things have their essential properties according to which they are what they are. This philosophical stance is called the essentialist assumption (Birsch, 2003:165). As far as an object continues to retain the said essence, the object is said to hold an identity of its own. Dialectical reasoning in contrast maintains that the essence of an object is its perpetual subjection to change. Far from being fixated, reality is constantly going through

series of changes for which reason it is continually renouncing its original identity at any given point in time. Hegel (2010), in the *Logic of Science,* made the point that existential thesis, as a state of quality, is always preceded by an existential quantity, which, by its very existence also presupposes the prior existence of another quantity (Hegel, 2010).

Ipso facto, one finds out that any quality, say A, is ultimately not true to itself because not only is it a result of previous quantitative change, it is also gradually renouncing its present identity, the cycle continues ad infinitum. Because of the perpetual flux of the state of affairs, any principle that forbids the reality of transitional phases, where objects are denied the laxity of free "flow" is unwelcomed in dialectical thought. Thus, the law of excluded middle, which holds that a thing, say A, is either true to itself or false is given no operative space in dialectics, given the notion that A is fast approaching another ontological state. To this end, Trotsky writes:

> Dialectical thinking analyses all things and phenomena in their continuous change, while determining in the material conditions of those changes that critical limit beyond which 'A' ceases to be 'A', a workers' state ceases to be a workers' state (1942:51).

Engels (1996:19) contrasts the way to understand dialectics with the traditional construal of the law of identity as he regards the latter as metaphysical worldview. Engels reviews the law of excluded middle by describing the proponents as follows: "For him (the metaphysical thinker) a thing either exists or does not exist; a thing cannot at the same time be itself and something else. Positive and negative

absolutely exclude one another; cause and effect stand in a rigid antithesis one to the other" (1997:68). From the reconceptualization of the law of identity arose the endorsement of the law of the transformation of quantity into quality, and from the rejection of the law of excluded middle comes the law or negation of the negation. According to Palgrave & Simoulidis (2003) the three laws of dialectics, namely: the law of the interpenetration of opposites, the law of transformation of quantity into quality and the law of negation of the negation tend to be universally and unconditionally valid in dialectics. According to Engels (2001), these laws developed by Hegel are the defining essence of dialectics.

The fundamental laws of logic which have been discussed only enlighten one of how dialectics relates to antecedent Aristotelian logic. Attention is now turned to what it is. Engels (1997:29) says of dialectics that it is the mode of conceptualizing reality wherein things and their mental reflections are joined together by ever unending motion, as things come into being and pass out of existence. The preceding rivalry of thought system, metaphysical thinking, implicitly outlawed the reality of motion or at best regarded it as illusory. To the metaphysical thinker, reality consists of finished products. To this end, Parmenides and his followers regarded change as delusion, existence as one, immovable, ungenerated and never perishing (Armstrong, 1957). Dialectical reasoning grasps the world of realities as a process of development that conjoins the metaphysicians' fixated realities under the law of motion. Change in the dialectical sense must however be contrasted with the ordinary understanding of change. The Milesian interested in the nature of reality regarded some chosen

primordial stuffs as ultimately real out of which all other substances emerge. Truth be admitted, change as it applies to the primordial substances was mere extensions of the primordial substances as a result of some rational proportion of alteration in the arche. This change, even though it leads to the formation of some supposedly new substances, is only quantitative [Copleston, (1980), Amstrong, (1957), Kirk, Raven, & Schofield (1985)]. Marxian dialectics admits of the reality of quantitative change. However, the point where Marxian dialectics made a breakthrough was the perfection of a conceptual mode of grasping reality beyond quantitative change. This it did by bringing the cognitive awareness of epistemic subjects to the critical point of change where quantity is transposed into quality. Trotsky's (1942:50) appraisal for dialectics, as it reiterates the said point is implicit in the following words: "To determine at the right moment the critical point where quantity changes into quality is one of the most important and difficult tasks in all the spheres of knowledge including sociology". Some explanatory example may be required here. As warm water approaches its freezing point, it is merely undergoing changes in temperature which result in a change in quantity as it expands. The water continually admits of these variations which in Marxian dialectics, is rendered negligible, until the threshold where water can no longer be tolerant of further increment in temperature. At this juncture, the water makes way for the usurpation of quantity by quality: water ceases to be and solidity assumes its position. Thus, whereas change for the Mileasians could be interpreted as to preserve the identity of the primordial substance, dialectics conceptualizes change as a kind of unity in which the

resulting synthesis envelopes the original variables while at the same time superseding the said variables taken independently (Popper, 1966:12). This thought is further vindicated in Engels' (1996:96) grain analogy as the progression of the seedling is enhanced by its destruction in a fertile soil. Dialectics cognizes reality as constantly involved in motion. It is in this essential feature of things as they are perpetually undergoing change (which metaphysical system of cognizing reality takes for granted) that the unfolding quality of reality reveals itself.

Dialectical Materialism

Engels (1996:99) construes dialectics as the scientific basis of the laws of motion, development of nature and human society. This mode of cognition is applicable to two categories of ontology: idealism and materialism. Under the scholarship of Hegel, dialectical thinking reached the pinnacle of perfection, albeit with an idealistic ontological foundation. The laws of dialectics have had no additional clauses ever since Hegel brought those laws to where they stand now, says Novack (1991:39). For Hegel, reality begins as a product of a simple idea, pure being in consciousness, and culminates in the highest idea, the absolute. The highest idea, absolute spirit he calls it, is that which has achieved a complete overhaul of itself as it purged itself of all contradictions through self-reflective exercise. Dialectics in Hegelian thought therefore constitutes the mode of awareness of the developmental phases, from the simple idea to the absolute spirit [Hegel, 2010:49, McTaggart, 2000].

In contrast to Hegelian metaphysics, Marx takes a much practical approach to the quest of understanding reality. Marxian critique of Hegel is not entirely original. It follows from Feuerbach's criticism, which holds that Hegelian idealism led to institutionalizing a belief in "extra-mundane creator" (Engels, 1996:13). In the first thesis of Feuerbach, Marx expressed his departure from Feuerbach's materialist account of reality. Dialectical materialism, to begin with, is an ontological redress of Hegelian idealism. As opposed to Hegel, Engels thought that primary existents consist of matter and not ideas. By construing matter as reflections of eternally existing ideas, Hegel was accused by Engels as having stood reality on its head (1997:30). Because Hegel's ontological exposition is idealism in content, it required consciousness as its functional basis. In the light of this supposition, Hegel (2003, VIII) points out that "What is rational is actual; and what is actual is rational". And what kind of rationality requires no consciousness? From the necessity of consciousness which is required as a starting point, Hegel begins to gradually grow his edifice of reality from pure being, by which the purgation of contradiction culminates in the formation of the absolute. However, consciousness itself is part of the fabric of nature. If that is true, then consciousness itself must be explained in terms of the way the world operates and not vice-versa. To this end, Engels (2001:20) writes, "the universe, willy-nilly, is made out to be arranged in accordance with a system of thought which itself is only the product of a definite stage of evolution of human thought". Matter, Engels (1996) holds, is far from being a product of the mind; however, the highest stage in the development of matter lies the evolvement of mind itself.

Engels (Engels, 1996) alludes to Darwinian theory of evolution according to which organic structures including man, through chemical processes, are a product of originally unicellular germ resulting from product of protoplasm or albumen.

Dialectical materialism is therefore defined by two core claims. First, reality necessarily operates according to the laws of dialectics: the law of the transformation of quantity into quality and vice versa; the law of the interpenetration of opposites; and the law of negation of the negation. Secondly, ontologically, the fundamental building block of the universe is matter. So, in *The Critique of Hegel's Philosophy of Right,* Marx stated that whilst Hegelian dialectics was idealist, his (Marx) is materialist. The sense of "matter" as it occurs in dialectical materialism needs delineation before proceeding to the explanation of the second claim of dialectics as spelt out above. In Orthodox Marxism, matter is understood not as any ordinary bare material or dehumanized substances as construed by the philosophy of the atomists (Russell,1945:785). Since Trotsky (1942) was considering the progression of the dialectical process in terms of the termination of workers' state, one has a clue that matter, as it occurs in "dialectical materialism", connotes a specific kind of social relation. In *The German Ideology*, Marx and Engels (2010) express the idea that individuals, their activities and the governing material conditions form the starting point of his enquiry. Orthodox Marxism therefore construes matter essentially to mean the way man produces his needs, of which the most important factor is the ownership of the means of production. In this sense, Marxian materialism aligns itself with

economics (Russel, 1945:785). By so doing, Marx draws a basic relationship between all disciplines of enquiry, according to which economics assumes the basic denominator.

Dialectical materialism has been criticized in several ways. However, the objections to dialectical materialism that concern this study are those objections that are targeted at unseating dialectical materialism from the seat of science which, when taken seriously, seem to have rubbished Marxism as a whole from the realm of the sciences. In this regard, Karl Popper becomes the central figure to consider. Popper (1962) on the anvil of demonstrable proof concludes that dialectical reasoning leads one to the justification of every statement, given any two contradictory statements. Owing to this "faulty" feature of dialectics, Popper, in the *Open Society and its Enemies* declared, "Yet of course, dialectics is sufficiently vague and adaptable to explain anything at all and therefore a classless society also, as a dialectically necessary synthesis of an antithetical development" (1966: 336). The crux of the matter is that because of the misguided essence of dialectical reasoning, any knowledge constructed on that basis is equally misguided since the contradiction of such knowledge could have also been deduced. His words here mean that, it is clear that by the same method, one might have inferred any other preferred statement, its negation as well (1966: 319). Accordingly, Popper holds that "the acceptance of contradictions must lead here as everywhere to the end of criticism and thus to the collapse of science" (1966: 321). The dialectical method of cognizing reality, which was meant to be

scientific has been declared on the contrary, to be antithetical to the very scientific value it intended to uphold.

Here, reasons are adduced to answer why such criticisms that deny dialectics entry into the realms of the sciences are misguided. In chapter four, positive reasons are adduce to answer why dialectical materialism in particular suffices to retain a scientific label on the anvil of falsificationism. First of all, Popper was not generous enough in interpreting the dialectical method as espoused by Orthodox Marxism. What he took dialectics to be was not only a misrepresentation of Orthodox Dialectics but a display of an uncharitable hermeneutical attitude. In spite of the incessant use of "contradiction" by Orthodox Marxist, the sort of contradiction intended trampled upon the Aristotelian sense of the word. First, the numerous examples cited by Engels and Kautsky (which have earlier been discussed), the criticism of Heraclitean conception of contradiction by Engels, and the emendations made to the concept of contradiction in the *Anti-Duhring* give a clear impression that Popper was not fair in the application of the principle of charity. It takes a little reflection to notice that Engels and his associates could not have meant A and non-A when the term "contradiction" is applied. Popper seems to have realized this and yet what he says in the end was only a recommendation about how the term "contradiction" ought to be applied in order to avoid some ambiguous interpretations. For example, Popper (1966:321) holds that "And they (dialecticians) like to use the term contradictions when terms like "conflict" or perhaps "opposing tendencies" or "opposing interest", etc., would be less

misleading. It is hereby suggested to Popper that the recommendation he made is the sense in which dialectical reasoning is to be understood by himself. By so doing, the need for criticism and consequent dismissal of dialectical reasoning from the realms of the sciences (as Popper did) would have translated into a need for redress or clarification, which when taken serious, rather endorses the scientific status of Marxism.

Now dialectical reasoning has to be stripped off the uncharitable interpretation of "contradiction". The result is this: the consequent criticisms which hold that Marxism, which essentially thrives on dialectical reasoning, is able to generate all forms of auxiliary statements which shield it from refutation and hence unscientific (Popper, 1962:38) is misplaced. In a recent article, Groisman cites examples from quantum mechanics by which reality, light in particular, permits of dual incompatible essences, particle and wave. Relating this to dialectical materialism, Groisman (2010:9) wrote: "But they (inherent contradictions) are not logical contradictions. They are contradictions in the operational sense. They are contrastive sides or aspects of one real object or thing, but not contraries (i.e. mutually exclusive) in the logical sense". Classical physics provided a corpuscular picture of the reality, wherein reality is made up of discrete entities with definite spatial properties as well as its behaviour being governed by Newtonian laws of motion. This classical picture of reality began to lose explanatory power as a new phase of development unfolded. Maxwell, drawing inspiration from Faraday's experiment, united electricity and magnetism with a specific prediction that oscillating electric charge in a magnetic field will

generate a radiation, light for that matter. According to this new development, light, unlike the particle-like feature provided us by the classical picture, assumes a wave-like picture (Afnan, 1998). The issue that had to be settled was whether a particle that was said to be governed by Newtonian laws can be a wave. Most physicists uphold the thesis that depending on circumstances, particles have wavelike features in the quantum world. Groisman concluded that reality should be understood to be vested with contrasting sides. This is an alternative model in which dialectics could be understood without necessarily having to invoke the concept of contradictions in the Aristotelian sense.

Whichever way the controversy takes, it is clear that, a redress of the notion of contradiction ought to have been suggested by Popper in place of his entire dismissal of dialectics from science. Marxian dialectical materialism construes reality with regards to the mode of production of which the most important is the ownership of the means of production. In this respect, Orthodox Marxism takes off from two contrasting ontological positions, the bourgeoisie and the proletariat. Marx affirms this ontological basis at the beginning of the *Communist Manifesto*, "The history of all hitherto existing society is the history of class struggles. Freeman and slave, patrician and plebeian…". Accordingly, Marxism recognizes humanity not in relation to gender, sex, race, colour etc, but only as a placeholder in the spectrum of property ownership. A human person is therefore a proletariat or a bourgeoisie, the former is an owner of the means of resources, the latter does not own resources and has to sell off his labour power to the bourgeoisie in order to make a living. Strictly speaking, for contradictions to

hold under Aristotelian logic, the truth value of the contradictory variables cannot be of the same truth values. If A is true, non-A must be false. In Orthodox Marxism, all forms of contradictions collectively culminate into one big contradiction; the friction between the bourgeoisie and the proletariat (Marx, 1972). The vexing question is; could the classes of proletariats and bourgeoisie stand in opposition as required by the concept of contradiction in terms of truth value? At first sight, it may appear that if one is not a proletariat, then one is a bourgeoisie and vice-versa and such a relationship may be suggestive of contradictions in the Aristotelian sense. If the notion of contradiction suggested by proletariat and bourgeoisie classes are contradictory in the Aristotelian sense, then, Popper should be right in both his interpretation and criticism of Marxian dialectical materialism. However, to challenge the notion that the ontological categories of dialectical materialism are actually contradictions in the Aristotelian sense brings to light an interesting consequence. The proposition identifying someone as a bourgeoisie or a proletariat could both be false if the prevailing social order is a classless one. In other words, the possibility of a classless society renders the exclusive dichotomy of bourgeoisie and proletariat categories as obviously mistaken dichotomy of contradictions. Popper (1966: 346) identifies as much as seven possible divisions of different class categories, which go further to undermine the proletariat-bourgeoisie dichotomy as a well cut out contradictions. In fact, there are some concessions on the part of Marx himself to the effect that some classes other than the proletariat and bourgeoisie exist (Popper, 1966:347). These classes consist of the artisans, small scale manufacturer, and the peasants

(*Communist manifesto).* But as shown earlier, in a relationship of contradictions, the truth value of both classes cannot be false. Accordingly, the possibility of a classless state renders the proletariat-bourgeoisie dichotomy unfit to retain the label "contradictions" in the Aristotelian sense. As such, Popper risk committing the fallacy of false dichotomy if he regards "contradiction" in Marxian dialectics as Aristotelian. Secondly, the law of contradiction as conceptualized by Aristotle is a formulation that concerns a single entity under discussion at a particular time, as in when one says A and non-A. Here, the law of non-contradiction only forbids that something could exist which is a direct denial of its own identity at the same time as expressed by A and non-A. The opposition, however, between the proletariat class and the bourgeoisie class is not one that each class individually denies its identity, as in, a proletariat is a non-proletariat or a bourgeoisie is a non-bourgeoisie. The notion of "denial" hereby meant for Marx, a relation of opposition between the bourgeoisie and the proletariat which consequently will achieve a synthetization into the classless society; "the proletariats have nothing to lose but their chains. They have a world to win. Workers of all country, unite!" (*Communist Manifesto).*

There is one more evidence that favours the prescription that Marxist dialectical law of opposition underpins the very configuration of the universe. According to Hawking (1989), the two great theories that rule the world of science today are the general theory of relativity and quantum mechanics. These two theories are however inconsistent with each other. In the voice of Hawking, "they cannot both be correct" (1989:13). It is the synthesis, quantum theory of

gravity that is envisaged as the harmonious platform of the said opposing theories. Knowledge truly develops dialectically.

If the above discussion relieves dialectical materialism from the gruesome objection that it asserts contradiction in the Aristotelian sense, then Popper's criticism, which holds that dialectical materialism cannot foster rationality and therefore destructive to scientific theorizing is nothing more than a gross breach of logical fairness. In other words, it fails to render dialectical materialism as unfit basis for scientific theorizing. Another objection closely linked to the first is Popper's accusation that because dialectical reasoning is vague, its explanatory scope is so unreasonably wide that it could explain, in his words, "quite different things" (1962:316). Two examples are cited from *Anti-Duhring* by Popper to argue this point out. First, the use of dialectics to explain the stages of the growth of a seed into plant and consequently more seeds out of the plant. The second example relates to how the product of a negative quantity gives rise to a positive quantity. In the former example, it is not clear the sense in which the growth of plants is said to be irrelevant to the operation of dialectics. Engels (2001) points out that dialectics is the science of the general laws of motion that encompass the development of nature as a whole. What needed to be done by Popper was a demonstration of how the process of growth by plants is not in accord with the mission envisioned by the dialectical stages. Accordingly, the former criticism is at best underdeveloped or lacks adequate details and hence unintelligible. In the latter example relating to mathematics, it must be admitted that the application of dialectics by Engels was quite arbitrary. But even here, if the laws of dialectics

were not clear enough to allow for application as Popper would want us to believe, it would have been a miracle for Popper to have come to the realization that its application does not fit the mathematical context laid before it. In relating dialectics to mathematics which Engels did, one could say of the context that it is a specific case of the misapplication of dialectical materialism by Engels. This misapplication, does not however, overrule the general validity of dialectical materialism.

It is worthy to note the major point under discussion. In the *Conjectures and Refutation*, Popper (1962) holds that the earlier formulation of Marxism, after they have been falsified, were reinterpreted in a manner that shields it from inherent flaws. The logical basis of the capacity of Marxism to generate these irrefutable auxiliary statements is identified to be in the nature of dialectical reasoning itself. It was demonstrated per Popper's analysis that because dialectical reasoning asserts contradiction, every conclusion is deducible from it. Because every conclusion, even contradictory ones could follow from dialectical reasoning, dialectics runs counter to rationality, and hence unfit for scientific theorizing. What the preceding discussion has achieved is that it has succeeded in crumpling the logical basis upon which Popperian criticisms rest. It has been shown that dialectical materialism conceptualizes contradiction not in the Aristotelian sense as Popper would want us to believe. Accordingly, Popper's agenda of showing the unfitness of dialectics in scientific theorizing ought to be consensually described for what it is; it channels great academic effort into dealing with self-invented problem.

Historical Materialism

Dialectical materialism as shown (refer to page 42-43 in this work), makes two core claims. The first is that what primarily exists is matter. Matter is hereby not construed as bare atomistic substance but how the basic necessities of life are produced. Secondly, this material base is said to be governed according to the laws of dialectics as spelt out from the very beginning of this chapter. Now, this mode of cognizing reality takes all forms of material substances as its object of study, both animate and inanimate substances. The principles of dialectics can equally be extended to the study of the evolution of human society. This has come to be known as historical materialism. In other words, historical materialism, otherwise called the materialist conception of history, is a result of the direct application of the principles of dialectical materialism to the course of human history. This section intends to show how dialectical materialism drives the evolution of society. This is achieved by showing clearly how a society, taken as an organic structure, follows these two core prescriptions of dialectical materialism.

Dialectics and The Evolution of Society

The basic unit of a society is a human person but the human person's existence and development require the community. A Community is, therefore, a group of interconnected persons with the absolute reason to survive or preserve their existence (Currie, 1973:1). However, food, water, shelter and clothing, Marx (200:9) says, are ontologically prior to everything else (Lepore,1993). Without the satisfaction of these basic necessities of life, individuals will die off and without

the existence of individuals, human society cannot exist. To meet this need for survival in the most efficient manner, individuals organize themselves into a society. Consequently, the structure of every society has as it foundation, the ways by which the group of persons designated by the term "society" organizes themselves to produce their needs. Led by this notion, Marx and Engels write:

> …we must begin by stating the first premise of all human existence and, therefore, of all history, the premise, namely, that men must be in a position to live in order to be able to "make history". But life involves before everything else eating and drinking, a habitation, clothing and many other things. The first historical act is thus the production of the means to satisfy these needs, the production of material life itself. And indeed this is an historical act, a fundamental condition of all history… (2000:3).

It follows that the defining principle of every society is its mode of production without which a society falls apart. That is to say, no matter where on the globe a society finds itself, if it is made up of human individuals, and these individuals produce their means of subsistence, then, not gender, sex or race but the mode that the society imbibes to produce its material needs is the core defining principle of that society. Accordingly, the first core claim of Marxian dialectics is not only evidently a manifest truth but also a necessary condition for the evolvement of culture.

Marxian dialectics further construes society as an organic substance (Sheehan,1993). This is a borrowed thesis from Hegel. Hegel takes reality to be an organic substance involved in constant intellectual strife aimed at knowing

itself better (Miller, 1997:23). The mundane manifestation of this divine idea in Hegelian thought is the state (Kenny, 2010:725). For Marx, society, particularly the way it produces its needs is reality itself and not a manifestation of what is real. By that very fact, the essence of this organic structure is the very mode by which it produces its needs. If the very mood by which it produces its needs cannot support its existence, then the organic structure must vary it in order to appropriately adapt to its "environment", lest it withers off. But because its essence is the mode of production, varying this mode of production correspond to a progressive variation of its identity as well. In conformity with this development, Trotsky (1942:52) identifies Darwinism as the highest triumph of the application of dialectics to the study of organic matter. This explains why Sheehan's (1993:23) claim that "Marxism extended and complemented Darwinism, pushing the conclusion of Darwin further in the direction of the new philosophy of nature" is clearly a valid submission.

Following the development from individual existence to group living, society is led to the very first evolutionary stage. Marxian dialectics postulates the communal state as the primary societal life, which is where all societies began. According to Engels (1999), the most primitive stage of communal lives was underpinned by hunting and gathering of fruits nuts and roots. According to the scheme of dialectics, such a mode of productions assumes the status of a thesis. For the organic society to perfect its being, some realities antithetical to the prevailing mode of production is attracted. Engels claims that limitations are in Marxian sense contradictions worthy of negating an established thesis (Engels,

1996:99). At that primitive stage of production, the bankruptcy in technological advancement against the gradual rise in population serves the invitation need of contradiction. The limitations are hereby exemplified by poor weather conditions, unavailability of storage facilities amongst others. The resultant synthesis manifest in the necessity for man to now move away from the search for food to the cultivation of food. As the transformation of quantity into quality takes effect, nomadic bands now began to live a settled life with shared property and with equal rights to productive resources (Engels, 1999: 192). Hunting and gathering and ensuing opposition (challenges) evolves into a dialectical synthesis. Communal life is at its perfection.

Communalism assumes the status of a newly established thesis. It is hunting and gathering negated. A communal state is made up of agricultural families who produce all their basic needs, food, clothing, and housing according to the proportion of the family's demand. (Kautsky, 2000:6). Mboya (1963 :603-604) has clearly illustrated communal living in the African socio-economic set-up and it is therefore prudent to be economical in belabouring this mode of production. Agricultural practices, marked by hunting, fishing, and rearing of animals gain a settled place in the affairs of humanity (Marx & Engels, 2010:33). As a newly evolved state of quality, communalism takes a trajectory towards change as preordained by the laws of dialectics. Communalism grows both in productive forces and a corresponding growth likewise occurs in production output. By growth, what is meant is that from the communal state, the production capacity increases [as better insight into nature serve the impetus for

technological advancement according to Mboya, (1963:611)] with a corresponding increase in the need for labour. The quest for perfection in the mode of production ignites the dialectical drive. The negated thesis attracts its own new set of conflicting challenges. The conflict (or contradiction in the Marxian sense) is hereby exemplified by an increased in the amount of work to be done as against the fewer numbers of available human resources (Engels, 1999:195). This gives rise to what Engels (1996:104) described as a social state; "where considerable inequality of distribution (of the amount of work) among the members of the community sets in; this is an indication that the community (communal bond) is already beginning to break up)." The peak of the contradiction is exemplified by wars meant to capture and enslave the loser to supplement the deficit in the productive forces (Engels, 1999:195). The threshold of communalism burst asunder. The contradiction is synthesized in the dissolution of the communalist state. The new mode of production gives society a new phase of identity. Quantity has gradually transformed into quality; the negation is itself negated. Communalism loses its identity and gives way for the inception of slavery (Engels, 1999). Kautsky (2000) remarks that the usurpation of the communalist society by slavery marks a distinctive historical epoch in the development of a given society. It brings into social order a new phenomenon that has never characterized the previous social relations, exploitation of man by man. It awakens "the first great cleavage of society into classes: masters and slaves, exploiters and exploited" (Engels, 1999:195).

To better appreciate the dialectical drive from slavery to feudalist societies and consequently capitalism the need to differentiate two kinds of social revolution is key. In general, social revolution is about change in the mode of production, specifically the ownership of the means of production. This transitional change occurs at two levels. At the first level, the means of production are transferred from one entity to another entity, both sharing the same exploitative intent, which is how Marx understood the French revolution. Marx held that the French Revolution changed the ownership of the means of production from feudal lords to bourgeoisie classes (*Communist Manifesto).* Thus, the term "bourgeoisie revolution" is a Marxian preferred rendition of change in property relations between two exploiting classes. The term has been used by Smith (2003:69) in describing the Russian February revolution of 1917 and shall be looked at in detail in chapter four. This is not the ultimate revolutionary change envisioned by Marxism. Engels took this view when he wrote that "The emancipation of the proletariat can only be an international event: you render it impossible if you try to make it simply a French event" (Hookham, 1967:648). The second level of revolution relates to the abolition of property relations itself, it relates to the change of property ownership from the bourgeoisie class to the workers' society (*Communist Manifesto).* Now, the projection of dialectics is that a thesis (designated as quantity) ought to take a transitional flight into a synthesized qualitative stage. This transition is however mediated by gradual maturation of the prevailing thesis, which allows the prevailing thesis to generate its own counterpart antithetical to its everlasting

prevalence. This is what Conforth calls the growth of the thesis as distinguished from development of the thesis. Conforth (2015:78) regards growth as the gradual augmentation of the thesis merely in quantitative terms whereas development is essentially marked by a leap over the threshold of quantitative growth where quantity evolves into quality.

Hitherto the inception of capitalism, not all societies have been through all three stages of dialectics (communalism, slavery and feudalism) but since the collapse of communism, societies have witnessed class disintegration involving the somewhat prevalence of exploiters and the exploited (Ogundowole, 1988:107). Conditions of slavery likewise differ from place to place and from time to time, but as a mode of production it is characterized by at least three basic features: (i) Almost everywhere it occurs, it serves as a source of cheap labour (Fiehn, 2006), which in the long run analysis, serves as the basis for the generation of surplus value. For where labour wages equal cost of production, production capacity runs out of existence (Kautsky, 2000). (ii) All produce under the designated mode of production is owned by the slave master which is why the enigma of alienation arises (Thornes, 2008). (iii) Perhaps the most untold feature of slavery is that the epoch of slavery is followed by an ideological superstructure, the state, whose chief function it is to be defensive of the mode of production, as conflict is bound to arise due to class inequalities. Now, the prevalence of all three conditions in present day mode of production is a clear indication that capitalism has changed slavery in form and not in substance (Capital, 2015, 541). To this end, Marx reiterates "The advance (from slavery)

consisted in a change of form of this servitude, in the transformation of feudal exploitation into capitalist exploitation" (Capital, 2015: 451).

It is in the light of the narrative above that Trotsky (1942:51) construes dialectical thinking as analyzing "all things and phenomena in their continuous change…". Just as feudalism is only a change in form of slavery (Marx & Engels, 2010:33), so is capitalism a product of the continues change in the form of feudalism giving the fact that property relation and conditions (i), (ii), and (iii) still persist. In the scheme of dialectical operation, the overthrow of slavery connotes a change of quantity into quality. The change of quantity into quality is marked by that critical point in which A ceases to be A, property relation ceases to be. In a synonymous phrase of Trotsky (1942:51), "…a workers' state ceases to be a workers' state". It follows that only the form of slavery has changed, as typified by feudalism and capitalism. Affecting the same side of the issue, Nkrumah (1969:54) says that the identity of personhood is borne by his "fruit". In this way, he uses exploitation as the basic denominator according to which he categorizes slavery and feudalism as producing fruits whose eaters are other than the producers. A change worthy to be labelled qualitative, therefore, ought to obtain features that rid the mode of production off the capacity to enforce exploitation. Such a change is not to be associated with the change from slavery into feudalism. It must be typified by extinguishing exploitation itself.

In the light of the discourse above, feudalism, which ties the worker to a designated land is a form of exploitation of the serf by the landowner. For the land owner appropriates an unpaid for value from the labour (Marx, 2000:7) and

so is capitalism. Here, one ought to be reminded of Hegel whose dialectical stages consist of the Absolute, perfecting its being with greater freedom (Kenny, 2010: 725). Under capitalism, the plight of the proletariats in terms of freedom of work is made better than as it were under slavery and feudalism, giving a clear indication that slavery, whose modification is given form in capitalism is presented as a thesis under self-perfection. The proletariat under conditions of capitalism does not gain freedom from being enslaved. The privilege given him is the freedom to choose in whose hands he wants to be enslaved. Since the proletariats do not own means of production, they cannot but to "enter into definite relations that are indispensable and independent of their will" (Marx, 1999:1). Rightly so because the proletariat survives sorely on the sale of his labour power. Focusing on the idea of freedom under capitalism, Rand (1966: 27) claims capitalism provides individuals the freedom to succeed according to the ability of one's innovative thinking. Be it as it may, as the organic society perfects itself in freedom, it manifests both in consciousness and association formations. As opposites interpenetrate, capitalism as a thesis continues to attract its antithesis. Poised to exercise a social change, the wheels of dialectics, says Marx, attracts the needed conflict to negate the capitalist state *(Communist Manifesto).* As our freedom to thinking grows, proletariats are growing in consciousness about poverty, inequality, and exploitation which are antithetical to eternal prevalence of the status quo. The synthesis envisioned by dialectics under communist states is a perfected freedom not from work, but from exploitation. "What the bourgeoisie, therefore, produces, above all, is his own

gravediggers" (the unified force of the proletariats). Workers of all countries are hereby called to unite for this freedom. They have nothing to lose but their chains! *(Communist Manifesto).*

Political Economy

The Contradiction in Post-Communalist Production

Since the breakdown of communalism, history has witnessed modes of production essentially characterized by the exploitation of man by man. The justification for the appropriation of surplus value by the bourgeoisie class, though unjustified, is associated with the private character of property relations. In slavery, the justification relates to the bourgeoisie's initial capital from which slaves were bought whereas feudal lords may deem exploitation justifiable because of ownership of the land to which the serf's labour is tied to. Marx and Engels (2010), in the *German Ideology* has questioned this basis. For him as well as for the myself, nothing about land and initial capital respectively show how the surplus value ought to be appropriated. The means of production in itself neither dictates that it needs to siphon surplus value for its owner nor directs the surplus value into the pocket of the proletariats. Therefore, some intermediate premises are required by anyone wanting to claim ownership of the surplus value. These premises could be made evident by considering the contradictory relation between private appropriation of surplus value (owing to private character of property relations as discussed) and the social nature of the post-communalist production.

On the one hand, capitalism approves of the private character of property relations, the basis upon which the capitalist single handedly keeps the surplus value. To explain this further, one needs to consider that human relations under the production and distribution of valuables are governed by some classification of laws. The science of these laws is what Engels called political economy. The first is that the laws that govern the mode of production, distribution and exchange of material needs are everywhere the same (Marx & Engels, 1996). The second is from classical economics of which mention could be made of Ricardo; in the free and fair market system, everything exchanges for its true value (Marx & Engels, 1997). In *Das Capital* (2010:27), Marx examines the source of value for any given commodity. Kautsky (2000:10) says a commodity is a product meant for the purposes of market exchange. Marx concluded that the answer is to be found in the amount of labour time expended in manufacturing the product. Following the second law, labour sells his labour power for what is due him, which is the worth of resources required to maintain his existence, it is labour's subsistence wages. However, labour agrees to work beyond his subsistence pay-hours. The extra labour power expended on the product generates what Marx called surplus-value: the extra value of a commodity that is unpaid for by the owner of the means of production, the bourgeoisie. The surplus value that the commodity accrues whilst in market circulation is what converts the initial invested value into capital. Capital is therefore a value of investment aimed at generating a higher value through the exploitation of labour *(The Communist Manifesto).* Kautsky (2000) holds that profit, which the bourgeoisie appropriates

unduly, is the difference between the wages of the proletariat and the value of his (proletariat) product.

On the other hand, post-communalist production is social in character. From the era of slavery, through feudalism to capitalism, production is done on a social scale, as groups of persons put their efforts together to produce a given product. The social character of production is implied by division of labour in producing any given product. For example, as the handcraft industry of the middle ages developed, division of labour equally intensified (Kautsky, 2000:10). As Marx (2015:30) remarked, "This division of labour is a necessary condition for the production of commodities". Marx was born in 1818 so when he speaks of modern industries, his most direct references are the industries of the 19th century. These are harsh working conditions that saw the proletariats as an extension of the material tools of production (*Communist Manifesto,* Kautsky, 2000:12). Now, it is the very social character of production made possible through the division of labour that elicit surplus value. The capitalist appropriates this surplus value on the basis of the private character of property relations. Marx's voice in the *Collected Correspondence* has been used to emphasize the neutrality of the means of production in terms of determining who should appropriate the surplus value. Nonetheless, following the social character of production, the generated surplus value, if anything at all, ought to be socially distributed. This is said for the reason that according to Kautsky (2000:12) "as soon as workers produced together in a factory, it was discovered that a division of labour increased the profits". If labour is the source of profit alone (not to talk of its increment), then they must

own the profit. Contrary to this view, "the owner of the instruments of labour always appropriated to himself the product, although it was no longer his product but exclusively the product of the labour of others", says Engels (1996:193). Thus, the appropriation of a socially generated surplus value by those other than the ones by whose effort the produce came into existence, non- working propertied class for that matter, is a manifestation of opposing interest at play. And in Marxian dialectics, I have conceptualized elements with opposing interest as contradictions. In Marx's implicit allusion regarding the nature of this contradiction one finds the following expression, "The transformation of scattered private property, into capitalist private property is, naturally, a process, incomparably more protracted, violent, and difficult, than the transformation of *capitalistic private property,* already practically resting on *socialized production* [emphasis added]**,** into socialized property (Capital, 2015:542). According to Engels (1996), this contradiction is the impetus of antagonism that, when the proletariat class grows full awareness of, will set the proletariat class against the bourgeoisie, of which the proletariat is bound to ultimately emerge victorious.

This chapter has shown that, far from invalidating the classical conception of contradiction, dialectics, by extending the scope of application of the law of contradiction, reveals the "soul" of social reality as it progresses according to the laws of dialectics. Of what use is this truth to us? Dialecticians say, and Popper (1962:316) agrees that the occurrences of contradictions in theoretical systems are prerequisites needed to occasion progress in intellectual discourse. Popper observes:

> It is true, however, only so long as we are determined not to put up with contradictions, and to change any theory which involves contradictions; in other words, never to accept a contradiction: it is solely due to this determination of ours that criticism, i.e. the pointing out of contradictions, induces us to change our theories, and thereby to progress (1962:316).

Since dialectical materialism extends the classical laws of logic to cover the specific conditions under which men produce their needs, global societies are therefore to be mindful of an impending change in the mode of production in accordance with the laws of dialectical progression. According to the eleventh thesis of Feuerbach, Marxism envisages this promising change which Marx summarized the procedure for its achievement as "abolishing of private property" *(Communist Manifesto)*.

CHAPTER THREE

A DEFENSE OF KARL POPPER'S DEMARCATION THEORY

In this chapter, three things are aimed at. First, by way of analysis, I attempt an exposition of the core claims of Popper's demarcation theory with relevant examples. Second, some selected criticisms of the criterion of falsificationism will be addressed accordingly. Third, the study attempts a juxtaposition of falsificationism, with dialectical materialism, in order to determine the latter's scientific credentials.

The seed of Popper's demarcation theory was sown in *The Logic of Scientific Discovery,* and the study begin from there. Popper unequivocally dismisses induction (which he defined as inference that passes from singular statements to universal statements) as useful logical foundation for scientific discovery. Two main reasons account for this dismissal. His reason for dismissing induction relates to the problem of induction which questions whether an inference involving universal generalization could in some way be validated on the basis of experience. As far as Popper is concerned, the riddle of induction is unsurmountable. Hume is copiously cited by Popper in *The Logic of Scientific Discovery* as having shown that there is no such justification for induction. In the *Conjectures and Refutations,* Popper reiterates his commitment to the validity of Hume's dismissal of induction as he writes:

> I approached the problem of induction through Hume. Hume, I felt, was perfectly right in pointing out that induction cannot be logically justified. He held that there can be no valid logical arguments allowing us to

> establish 'that those instances, of which we have had no experience, resemble those, of which we have had experience'. Consequently 'even after the observation of the frequent or constant conjunction of objects, we have no reason to draw any inference concerning any object beyond those of which we have had experience" (Popper, 1962: 42).

In the light of the submission above, Popper concludes that induction as a demarcation criterion does not even exist; it is simply an illusory method of knowledge acquisition. The virtues appropriate for scientific theorizing upon which falsificationism ultimately thrives are critical deductive rules, personal ingenuity, as well as try and error (Popper, 1962:53).

In place of induction therefore, Popper opts for deductive logical basis for scientific theorizing. In this way, Popper is like Descartes and unlike Bacon; the former preferred deductive logic, the latter endorsed the inductive method (Unah,1998:64). According to Popper's prescribed logic of testing theories aspiring to be labelled scientific, an unjustified idea is put forward and conclusions are drawn from it. These conclusions are compared by way of logical rules of inference (Popper, 2002). Now if the theory is to be tested by way of looking for confirming instances, then one is led back to the fallacy of affirming the consequent which Popper had already rejected as a challenge for induction. Popper, however, admonishes four different approaches to testing of theories in question. The first is the test of logical consistency of a theory. Second is the test of logical status, whether it is tautological or synthetic. In this way, a good scientific system or theory ought to be synthetic, representing a possible state of affairs (as opposed to metaphysical systems); for a tautological statement cannot

be falsified since it is true by definition. Third is the test of scope whether the theory constitutes advancement based on previous knowledge or not. Fourth is the test of empirical content, whether or not the prediction of the theory can give rise to implications that pertain to actual events in the empirical world (Popper, 2002:9). With regard to the last criterion, if the empirical application of the prediction proves contrary to what the theory envisages, the theory in question from which inferential deductions were made is falsified. Having been falsified, the theory is considered scientific, albeit, it becomes an obsolete theory of the sciences. If it proves its mettle in terms of empirical application, it is good until further notice: it has achieved corroboration. All these four conditions of theory testing will be revisited when expatiating the details of falsificationism.

The Project of the Logical Positivists

Popper (2002:19) says that his falsification criterion "is based upon an asymmetry between verifiability and falsifiability" which is the basis why the logical positivist cannot be ignored in a serious discussion of the falsification criterion. In the 1930s, the logical positivists envisaged building an objective criterion for the establishment of knowledge. The consequence was the verifiability principle championed by the Vienna Circle, according to which the meaning of a statement is to be found in its method of verification (Caldwell, 1991). Having taken inspiration from preceding philosophers of language like Russel and Wittgenstein, proponents of the verification principle hold that "meaningfulness" is found in only two kinds of logical propositions, namely, synthetic and analytic statements. While an analytic statement is true in virtue of

its logical structure, the truth of a synthetic statement is to be found in the relevant aspect of experience that verifies the proposition. Because verifiability constitutes a necessary aspect of all meaningful propositions, meaningful statements could all yield empirical evidence wherein truth value necessarily applies. Accordingly, if a statement does not state any possible state of affairs by whose truth value can be verified at least in principle, then that proposition is nonsensical unless it is analytic.

Examination of The Falsification Criterion

Popper agrees with the logical positivists that scientific statements should be synthetic and that such statements should have some relation with empirical events. The distinguishing features of Popper's theory of demarcation in connection with the preceding inductive method relates to two major features: deductive logical basis of theory formulation and the role of tested scientific theories. The rationale for the former choice is to be found in the problem of induction, wherein no amount of observed instances suffices to validate generalization. To understand the rationale for the latter, one must observe Popper's falsification criterion:

> These considerations suggest that not the verifiability but the falsifiability of a system is to be taken as a criterion of demarcation. In other words: I shall not require of a scientific system that it shall be capable of being singled out, once and for all, in a positive sense; but I shall require that its logical form shall be such that it can be singled out, by means of empirical

> tests, in a negative sense: it must be possible for an empirical scientific system to be refuted by experience (2002:18).

In *Conjectures and Refutations,* Popper (1962:39) holds that "it (falsification criterion) says that statements or systems of statements, in order to be ranked as scientific, must be capable of conflicting with possible, or conceivable, observations". Popper (1962:37) interprets the falsification criterion in the following numbered details:

1. It is easy to obtain confirmations, or verifications, for nearly every theory-if we look for confirmations.

2. Confirmations should count only if they are the result of risky predictions; that is to say, if, unenlightened by the theory in question, we should have expected an event which was incompatible with the theory-an event which would have refuted the theory.

3. Every 'good' scientific theory is a prohibition: it forbids certain things to happen. The more a theory forbids, the better it is.

4. A theory which is not refutable by any conceivable event is nonscientific. Irrefutability is not a virtue of a theory (as people often think) but a vice.

5. Every genuine test of a theory is an attempt to falsify it, or to refute it. Testability is falsifiability; but there are degrees of testability: some theories are more testable, more exposed to refutation, than others; they take, as it were, greater risks.

6. Confirming evidence should not count except when it is the result of a genuine test of the theory;

and this means that it can be presented as a serious but unsuccessful attempt to falsify the theory. (I now speak in such cases of 'corroborating evidence'.)

7. Some genuinely testable theories, when found to be false, are still upheld by their admirers, for example by introducing ad hoc some auxiliary assumption, or by re-interpreting the theory ad hoc in such a way that it escapes refutation. Such a procedure is always possible, but it rescues the theory from refutation only at the price of destroying, or at least lowering, its scientific status. (I later described such a rescuing operation as a 'conventionalist twist' or a 'conventionalist stratagem'.).

Criteria 1, 2 and 6 implicitly reiterate the problem associated with the inductive method, wherein the verification principle of the logical positivist is dismissed as inadequate evidential support for generalizations. Criteria 2 and 6 further assert that the test of a theory aspiring to be labeled scientific ought to be approached with an attitude that seeks to render as false the empirical implications of the theory in question. As such, the methodological rule assumed by Popper is directly antithetical to Lakatos' (1989:186) claim that unless anomalies affect hard cores of theories, it does not count as a refutation instance of the theory in question. Popper's preferred example is Einstein's theory of gravity. Einstein's theory of special relativity described how observation of physical laws are unaffected by the state of motion. This view of the universe however excludes Einstein's conception of gravitational law. Einstein's theory of gravitation is

found in his general theory of relativity according to which gravity is the effect of space-time curvature on matter. The prediction thereof is that since light is made up of photons, it too must appear bent over a curved space (Schumacher, 2013). Had light not appeared bent in Eddington's 1919 experiment when he measured the position of the stars close to the sun, Einstein's theory would have been refuted. The telescopic observation was an exercise towards showing a possible observational instance wherein Einstein's theory could have been falsified. Test for Popper means provision of clear-cut specifications by which theoretical systems, theory or hypothesis could be falsified.

The third criterion prescribes that theories ought to forbid certain state of affairs if they are to be considered good. This criterion is a necessary function of deductive logic which is what inspires Popper's logic of scientific discovery. Take the syllogism

Premise 1. A
Premise 2. B
Therefore, S

The syllogism holds that one cannot hold A, B and Not-S. Again, the syllogism is not suggestive of the conviction that A or B are actually true state of affairs. The only surety is that A, B, and Not-S cannot be held as true beliefs at the same time. One is faced with the prohibition of accepting non-S on the basis of premises A and B. Because the inferential relation does not guarantee truth, one is only cautioned to reject certain states of affairs on the basis that they are inconsistent with our own initial beliefs, A and B. This logical framework of validating theories inspires Popper's first criterion of theory testing in *The Logic of Scientific*

Discovery which was earlier rendered as the test of consistency. On this note, Stace (1970:346) holds that "Thus, the necessity which logic imposes upon us, if one is going to believe in such necessity, is purely negative and prohibitive. Its commands are never thou shalt, but always 'Thou shalt not".

The fourth criterion translates falsification into a succinct logical formulation, the basis upon which when combined with the seventh criterion, gets Marxism dismissed from the realm of science. The criterion holds that if a theory is scientific then it ought to be refutable by possible observable instances. It could be read as "if a theory is not refutable by any possible observable instance, then it is not scientific". One can infer from the above premise that if a theory is scientific, then it is refutable. Since Popper claimed that Orthodox Marxism has been rendered irrefutable (because of the nature of auxiliary statements) by any possible observable instance, a valid ensuing modus tollens yield the conclusion that "Marxism is not scientific".

The fifth criterion relates to Popper's earlier claim regarding the boldness of predictions. According to Popper (1962), conjectures must be boldly put forward pending refutation. To be boldly stated, a conjecture must imbibe clear-cut specifications and clarity according to which the theory could be refuted. Consider the following conjectures (i) it will rain tomorrow. (ii) It will rain tomorrow in Amsterdam. (iii) It will rain tomorrow in Amsterdam at 0600 GMT. Supposing it rains in Amsterdam at 0400 GMT, whereas conjectures (i) and (ii) have been confirmed, conjecture (iii) has been refuted. The difference between the refuted conjecture and the confirmed one lies in the degree of specification

allowed by the various conjectures in question. The more easily a theory's conjectures are open to refutation, the more testable the theory is. Because statement (iii) implies proposition (i) and (ii) together with further precision (the inclusion of time factor), Popper (2002) would say that proposition (iii) has better empirical content than its competitors. In the phraseology of Fraassen, (iii) is empirically stronger than the rest (Couvalis, 1997:175). The further and better empirical particulars provided by a given hypothesis determines with further detailed clarity, the range of occurrences in the state of affairs a hypothesis can prohibit. Popper puts the summary of this point in the fourth criterion of theory testing as spelt out in *Conjectures and Refutations*. It states that, a bold scientific theory forbids a lot more state of affairs.

The seventh criterion, if understood as a prescriptive principle, lays emphasis on which kinds of auxiliary statements are acceptable in scientific theorizing. Popper hereby admonishes practitioners of science to adopt only those statements that rescue a refuted theory by way of increasing the empirical content of theories. By so speaking, falsificationism requires that rescuing statements must set greater chances for refuting the theory in question; it must aim at prohibiting more state of affairs. Popper (2002:62) alludes to Pauli's exclusion principle as an example of a worthy auxiliary statement. Another example relates to Einstein's cosmological constant. The introduction of Einstein's cosmological constant which was meant to save his "static universe" prohibited a continual expansion of the universe (Liddle, 2006). However, it made the theory much more

vulnerable to falsification, and was accordingly refuted following the observational discovery of the red-shift by Hubble's telescope.

According to the hypothetico-deductive method described, from a given hypothesis, statement(s) is/are deductively inferred. The hypothesis then stands as an antecedent in a conditional statement whose consequent is the deduced proposition. I now set forth to falsify the consequent. If it turns out to be false, the antecedent is likewise falsified. Take for example the hypothesis "It will rain heavily in region A tomorrow at exactly six o'clock". From this hypothesis, it could be deduced that uncovered grounds of region A should get wet after six o'clock. The conditional statement resulting will read, "**If it will rain heavily at region A at exactly six o'clock tomorrow**, then *uncovered grounds of region A should get wet afterwards*". The scientist's job is to pursue the specified italicized consequent if it has been achieved after tomorrow six o'clock in region A. If the uncovered grounds fail to get wet, the antecedent is false and the hypothesis "*It will rain heavily in region A tomorrow at exactly six o'clock*" has been falsified. However, one cannot affirm the truth of a hypothesis if the consequent turns out to be confirmed, for such a reasoning amounts to the fallacy of affirming the consequent. According to Popper (1962) a hypothesis that receives confirmation after a rigorous test has only been corroborated; it has stood the test of time until further notice. Falsificationism is therefore a methodological principle for acquiring knowledge wherein knowledge progresses by way of exposing false hypothesis; the conviction power of the principle is that our held tentative beliefs are not at least false (Kluge, 2001). But if a hypothesis that has withstood even the

most rigorous test intended to falsify it cannot be said to be true, then of what use is the hypothesis? According to Popper, a corroborated hypothesis has a greater probability; it is in the likeness of truth. However, this high rated probability has no relation to future predictive success. The probability rating relates to explanatory success in terms of explaining past events (Salmon, Earman & Glymour,1992). Falsificationism is therefore backward looking, which is why it is unaffected by the problem of induction. It has no direct relation to future predictions. It does not "bite" more than it can "chew"; it does not announce what it cannot justify, it does not say what it does not know. It should be noted that if the explanatory power of a theory is so wide as to cover observations that would have otherwise falsified it, then the theory is a pretentious science (Ladyman, 2002). This relates to the third way of theory testing which Popper (2002) refers to as the test of scope. A theory with a scope so wide as to cover every potential falsifier is pseudo-scientific.

Criticisms Addressed

Criticisms of Popper's falsificationism have come in various "shapes" and "colours". First, the study deals with the cluster of criticisms that draw inspiration from what actually pertains in scientific practices. These criticisms allude to what scientists actually do. By showing how Popper's demarcation theory deviates from the practice of science, proponents dismiss falsificationism as impractical.

In respect of the above, Kuhn maintains that Popperian methodological rules have lost touch with actual scientific practices. Kuhn thus observes: "…our scientific knowledge must take account of the way science has actually been

practiced. That being so, a few of his (Popper's) recurrent generalizations startle me" (Lakatos & Musgrave, 1970:4-10). Also, it has been suggested that scientists sometimes disregard falsifying evidence in scientific practices. Falsifying evidence, it is said, does not always count as a crucial test for judging a theory as having been falsified. Bohr's atomic theory and Newton's description of the orbit of mercury were both regarded as once falsified. Their falsification instances never led to the abandonment of the theories in question, so critics say (Ladyman, 2002:89). Couvalis (1997:70) hails the same criticism, claiming that until one has a better theory to replace a falsified one, falsified theories are not abandoned. Throwing more light on the issue, Ansah (2015:4) alludes to Lakatos' example and advances the claim that because a scientist may not be able to determine within a spectrum of background theories and auxiliary assumptions where the faulty hypothesis lies when a theory is falsified, scientists prefer to modify theories in the face of anomalies rather than reject them outright. With regard to the practical relevance of the use of falsificationism in science, Ansah and Lakatos (Couvalis1997:69) are of the view that the history of science seems not to favour falsificationism.

The obvious conclusion of Kuhn, Ladyman and Ansah is that the practice of science falsifies Popper's falsificationism. First of all, Popper's methodological rule is prescriptive and this is clearly attested to by Ansah himself. As such, it owes no obligation to conform to what pertains in the actual practice of science. One may say that a methodological prescription ought not to lose touch with what actually pertains in the field. However, to make this appeal is not to consider it

obligatory. It may perhaps be a secondary concern which when stretched too far, makes a fallacious demand from Popper: is-ought fallacy. Speaking to the same issue, Maxwell (1972:133) holds that it is not inconceivable for a scientist to actually follow improper methodological rules. It follows that a prescribed methodological rule is not refuted if it does not conform to the prevailing standards of practice. Lastly, falsified hypotheses are not necessarily rejected as Kuhn may want us to believe. They can be rescued and are often rescued by auxiliary statements. The condition is that the auxiliary statements must make greater the chances of refuting the theory (Popper, 2002). For example, when it was found that the sum of energies of electrons and protons could not equal the energies of a decayed neutron, the law of conservation of energies faced a possible instance of refutation. Pauli however proposed that the process of beta decay was followed by the emission of some unobservable electrically neutral substance (later to be called the neutrino) which carries away the energy deficit required to sustain the law of conservation of energy. Later experiments in 1956 vindicated the auxiliary hypothesis (Amaldi, 1984: 75ff). A falsified theory is therefore not a theory hopelessly plunged into the garbage bin. I shall return to issues surrounding a falsified theory when Popper's concerns for truth value in scientific theorizing is examined. As Popper rightly pointed out, the task to which he is committed is not the search for a criterion of acceptability nor rejection of theories as hopeless. Falsificationism is a prescriptive yardstick for showing what science is and what science is not. But why falsificationism? Falsificationism is

better placed because its rival, inductive verificationism cannot logically be justified without circular reasoning.

The more serious problem is that adopting verificationism as demarcation criterion will open "flood gates" for theories which would have otherwise been considered unscientific. This has been suggested as a criticism that affects falsificationism also, but as will be demonstrated, the allegation is only ipse dixit. A modified version of Anthony Flew's anecdote (in Thornes, 2008: 256) is presented as illustration of the inherent weakness of verificationism. Supposing Joe has been convinced by his parents to entertain a strange belief that a particular decorative toy on his bed gallivants his room, but does so only when Joe is asleep in order to avoid being detected. The toy is so wise that it detects the very moment Joe is about waking up and hence returns to his static position, so the story holds. How is Joe ever going to refute this conjectured fiction? Joe may want to set up a camera or allow certain people to watch over him whilst he is asleep. The failure of the toy to show up in action when all the detective measures are put in place is consistent with the presupposition that the toy is intelligent to avoid detection. As such, all times Joe wakes up without any evidence that the toy actually exercised any motion strengthen his conviction and confirm his belief that the toy is actually animated, albeit a very intelligent one capable of outsmarting all attempts at detection. Joe can never disprove his belief, even if it is a myth just made up to terrify him from waking up at dawn. Verificationism cannot reasonably dissociate itself from this myth in the light of the expression that it is true by definition for the intelligent toy to be able to outsmart all attempts

at detection, which is always verified when no positive evidence could be adduced in support of the toy's inactivity. Therefore, every evidence that shows the toy's inactivity at any given time of the night could be said to be confirming the frivolous myth of the intelligent dancing toy. In confirmationism therefore, science and myth are clearly compatible, which is what Popper meant when he condemned Marxism, psychoanalysis and individual psychology on the basis that they resemble primitive myth rather than science (Popper, 1962: 35). As it were, the conjecture cannot be refuted. Only falsificationism serves a critical winnowing methodology for demarcating myth from science.

Attention is now directed to criticisms that border on the problem of underdetermination of theoretical systems. In this regard, Duhem's criticism against falsificationism marks the starting point. According to Duhem, deduced theoretical systems awaiting the test of falsification implicitly imbibe reference to theories, assumptions or the use of instruments which are not intended to be tested. As discussed earlier in page 81 of this chapter, the deduced hypothesis stands as a consequent in a conditional statement whose antecedent will envelope the conjunction of the assumptions, theories and instruments that underpin the deduced hypothesis to be tested. Since the entire antecedent is falsified if the consequent proves false, the problem arises as to how the practitioner of science is able to tell which of the antecedent theoretical assumptions, instruments or even the hypothesis at test is faulty. Duhem proceeds to conclude that a practitioner of science never disproves a single hypothesis but an amalgamation of theoretical systems (the use of theoretical systems show that the antecedent includes

instruments as well) (Duhem, 1906:183). The view that single hypothesis cannot be tested, rather, it is a whole set of theoretical systems, background theories and instrument that face the test for approval is called conventional holism (Fairweather, 2012:2). Take for instance Maxwell Clarke's law of electromagnetism as a deduced hypothesis from some general universal statement H. The law of electromagnetism as propounded by Clarke is inspired by the respective laws of Gauss, Faraday and Ampere (Thide, 2004). According to Duhem's criticism therefore, the falsification of the electromagnetism law could mean an error stemming from the law of Faraday, Ampere or Gauss. According to Demorgan's rule, one is led to a disjunctive statement of the form: not-F v not-A v not-G v not-H (where F stands for Faraday's laws, A stands for Ampere's laws, G stands for Gauss' law and H stands for the hypothesis under test). Now unless one can tell that F, A, and G are all true, one cannot conclude that not-H is true.

The core of Duhem's challenge leads us to underdetermination of background theories, assumptions and instruments involving all the antecedent conjuncts of the conditional statement. Many resolution discourses appeal to virtues of theories appraisal such as simplicity, scope, unifying power etc. as a way of identifying which background theory could be faulty if a hypothesis is falsified. These suggestions are rejected here because such theory appraisal virtues are intended to make greater the chances of theories being true (Tulodziecki, 2013:3732) and truth value of theories is not what bothered Popper (Popper, 1962:33). Other scholars like Morrison (2010:2) have simply challenged

holism in general as unmotivated. Duhem regards underdetermination as a necessary challenge of hypothetico-deductive logic as a whole (Trizio, 2001).

When one relates this to Popper, what that means is that modus tollens is not capable of isolating a hypothesis for the test of falsification. Popper (2002) does suggest that in such a dilemma, there ought to be intersubjective testing of theories preconditioned by what scientists have agreed on as the potential faulty assumption to be tested. Ladyman (2002) therefore concludes that falsificationism as a demarcation criterion is only applicable among a community of scientists who go into agreement regarding which background theory is being tested at any given time. This seems to be a vicious question begging resolution because it presupposes the fore knowledge on the part of the scientist regarding which of the assumption(s) is/are known to be false. But the decision regarding which theory assumption is at least false is what falsificationism is mandated by Popper to achieve. Popper (2002:112) admits that the defective assumption may reside among the stream of background assumptions. He retorts that further crucial future experiment could betray and lead us to reject the defective background assumption. Duhem could carry the criticism further by claiming that it will be an exercise in futility to subject any suspected individual assumptions to test since those individual "faulty" hypothesis will stand in the same condition; it will also invoke several background assumptions and theories that will be indirectly tested, leading to ensuing regress (Jones & Perry, 1982). However, there is no good basis established for thinking that infinite regress is bound to ensue from testing a given hypothesis. For the purposes of argument, in the event of such improbable

outcome, a staunch falsficationist may accept the retrogressive test of hypothesis with the vision that an absolute new page will be opened in the end for admitting every single hypothesis worthy to be called scientific. This is, however, untenably radical. Duhem offers "virtue epistemology" as a solution to the problem of underdetermination. Roughly put, virtue epistemology is an epistemic-agent based theory which holds that knowledge is a product of competence. Thus, it is the normative properties of the epistemic agent that constructs knowledge (Fairweather, 2012:676). The implication is that the scientist with "good sense" will be able to determine among the auxiliary background theories, what the suspicion is.

I associate himself with Ladyman's (2002:170) criticism that the notion of "good sense" is vague. On the one hand, the attempt to disambiguate the notion of good sense can be of rescue to Popper. However, to be consistent with the principle of falsificationism, I argue that assumptions which were not produced by falsificationism suffice to be looked upon first as the unwarranted systems leading to the falsification of the hypothesis in question. Thus, Duhem's good sense, if it is to be disambiguated in relation to falsificationism, should attribute suspicion to the set of prior assumptions according to the degree of independent corroboration status (Rowbottom: 2010). This is because if such assumptions were not produced by falsification, then as Popper has argued copiously by citing Hume, one can never justify their validity on the basis of the existing alternative philosophical methodology of science: induction. On the other hand, if all the assumptions have gained entry into science by passing the test of falsificationism,

then the new hypothesis under scrutiny should be considered as having been falsified. If all the assumptions stand on the same scale of falsification, then the new hypothesis being tested stands in the trouble alone because whereas all its "neighbourhood" assumptions have received the green light of falsificationism, it alone stands behind the closed door. In the end, one is assured of nothing but the best; a consistent framework for the sciences wherein all theoretical systems have been admitted on the basis that at least they are not false.

It has also been suggested that falsificationism, in spite of its contempt for induction as the method of science, after all lets induction in through the backdoor. Two independent rationales have motivated the same critical conclusion. Ladyman suggests that Duhem's problem of underdetermination brings to the knowledge of the falsificationist the extent of theory engagements in the testing of any given hypothesis. Rightly so, the falsificationist in testing a hypothesis presupposes that the featuring background assumptions in theory testing are good enough "ingredients" for setting up the procedure of falsificationism. However, this very presupposition regarding the goodness of background assumptions is motivated by the past success of the background assumptions. This is because it constitutes an obvious irrationality for the falsificationist to engage a hypothesis whose background assumptions he thinks are flawed. The fact that the falsificationist expects his test to yield a trustworthy result is a clear indication of future anticipation based on past successes won by the background assumption in question. On this note, Ladyman (2002:86) has concluded that, after all, induction is inevitable in falsificationism.

The core of Duhem's problem has been that hypothetico-deductive method in general and falsificationism in particular cannot isolate a hypothesis from theory. Thus, when a hypothesis is falsifified, the hypothesis and the background assumptions are all potentially suspicious accomplices. Our solution was that when a hypothesis is falsified, the science practitioner can direct his Duhemian "good sense" first to those background assumptions that were not admitted into the sciences by way of falsificationism. According to this emendation, the science practitioner should have in mind that the theories being used are trustworthy in virtue of their previous exposure to falsificationism and not based on previous confirmations that the theories have received. In this way, I submit, the science practitioner relegates the intrusion of inductive presuppositions as far as falsificationism is concern.

For Ansah, induction finds its way into falsificationism on the basis that falsificationism itself relies heavily on experimental set-up that employs observation just as induction does. He writes: "What can be deduced from this paragraph is that both inductivism and falsificationism thrive on observational evidence. Hence, the falsifiability principle is not after all devoid of induction, since empirical evidence is a property of induction" (Ansah, 2015: 8). In fact, Ansah at the end, attributes the said criticism to Ladyman (2002). However, to the extent that the rationale for arriving at the said conclusion seems to be altered and could be treated as independent argument, it is hereby approached in isolation. It is true Popper regards observation as indispensable in experimental set-up. The beginning of his writing affirms this conviction: "A scientist, whether theorist or

experimenter, puts forward statements, or systems of statements, and tests them step by step…. he constructs hypotheses, or systems of theories, and tests them against experiences by observations and experiments" (Popper, 2002:3). However, it is false that the use of observation by inductivist could be used to draw induction into falsificationism. Ansah makes the point that experimental set-up is used by inductivists to validate theories whereas in falsificationism, it is used as potential falsifiers. For Popper, observation as used in induction serves the basis of justifying generalizations and because no rule can justifiably permit this inference, induction is not only "invalid", it does not even exist (Popper, 1962:53). The right use of observation is to generate at least in principle a possible way of refuting a hypothesis and this distinction for Popper is very key. Observation is not as important as what it is used for, which is why Popper says that "it (a theory) cannot claim to be backed by empirical evidence in the scientific sense-although it may easily be, in some genetic sense, the 'result of observation" (Popper, 1962: 37). It is therefore surprising and uncalled for, if observation is used as a common denominator to invite induction into falsificationism.

The next criticism is a bundle of criticisms which affect the same issue of falsificationism. The basic denominator of this cluster of criticisms is that falsificationism is not feasible as a demarcation thesis because certain prior concerns that ought to be determined before the theory can be applied cannot be at least reasonably resolved. In *The Logic of Scientific Discovery,* Popper points out that singular statements are required to usher a hypothesis into the attempt to

falsify it. Thus, the first problem to be dealt with here relates to the character of singular statements and how they are tested. It must be noted that singular statements relate to experiential knowledge and this gives the associated problem an epistemological outlook. Popper (2002: 21) calls this "the problem of the empirical basis". Simply put, it questions the extent of surety a scientist can maintain in considering a basic statement as a true falsifier (Early, 1991). A basic statement, Popper (2002:21) says, is a proposition stating a singular fact. Its nature consists of facticity, self-consistency and of a singular kind (Popper, 2002:64). According to Popper, a necessary condition for theory falsification is the existence of an acceptable basic statement that reproducibly contradicts a theory (Popper, 2002:66). To be existential, basic statements must pertain to some state of affairs. For example, "there is object A in region B" or "there is not object A in region B" (Popper, 2002:83). This criticism finds solace in a much deeper skeptical argument about perceptual knowledge. It takes off from the premise that even if Popper's methodology of science is a good demarcation theory, introspective indistinguishability cases must be contended with first before Popper's theory can be applied. Since Popper lays huge emphasis on the empirical content of a theory as a way of determining the degree of scientificity of a theory, the need to rescue basic statements has a striking effect on Popper's demarcation thesis. Take for example our previously cited hypothesis of rainfall in region A at 0600 GMT. According to the nature of the basic statements, the required falsifier may thus be formulated as follows: "there is no wet ground at region A after 0600 GMT". How can one tell that this statement is true? If one cannot tell when this

statement is to be considered true, then one cannot set forth to falsify the hypothesis and Popper's whole methodology of science will be rendered inoperable.

A similar criticism takes the argument a step further. Supposing the introspective indistinguishability argument is weak and one can actually discriminate between veridical state of affairs from non-veridical ones, the very nature of some propositions are not open to falsification. Ladyman puts forward examples which include existential statements like black holes, atoms and DNA. These existential claims, he holds, are not falsified even after attempts to find them have failed (Ladyman, 2000: 82). However, this criticism takes for granted an important caveat associated with the fallacy of appeal to ignorance. The point is if a particular procedure of search is such that it is impossible for a truly existing object to elude detection by the procedure, then one is justified in claiming that the thing does not exist even if the use of such a procedural search does not unveil it (Bassham et al, 2011: 145). Let us put aside this answer and introduce another opportunity that could make the criticism much stronger. Let us assume further that under our current technological dispensation, a thorough search cannot unveil these substances even if they were to exist. On that note, the falsificationist risks committing the fallacy of appeal to ignorance if he concludes that such substances have been falsified because a thorough search to find them has failed. Other scientific principles also considered not falsifiable include the principle of conservation of energy, the second law of thermodynamics, and action at a distance (Boyd, Gasper & Trout, 1991).

In dealing with the mentioned criticisms, the study may have to venture into the epistemological underpinning of Popper's methodology of science. Popper, Caldwell says, is not a skeptic. Not only did he subscribe to the correspondence theory of truth, he believed also that the objective of science is the search for interesting truth (Popper, 1962:157, 225). Popper is however a fallibilist. Fallibism is the epistemological view that a demonstration of knowing absolute truth is unattainable, hence all knowledge claims are educative conjectures (Caldwell, 1991). As a fallibilist, Popper does not deny the existence of absolute truth. What he does deny is one's grounds of surety for having grasped (the) absolute truth. Popper (1962: 222) meant this when he characterizes science as the enterprise plagued with "problems-problems of an ever increasing depth, and an ever increasing fertility in suggesting new problems". This is in accordance with Popper's belief that one does not have the requisite intellectual resources to discriminate between truth in the absolute sense and truth as an intermediary process towards the absolute. For as he (Popper, 1962: 221) says, even if one chances upon it, one cannot identify it for what it is: absolute truth. Salmon et al (1992:50) would agree with Popper that it is prudent to concede the limitation of human knowledge because a demonstration of absolute truth is impossible.

What therefore, in Popper's view, justifies our tentative scientific knowledge? To this question Popper has no direct answer from the theories of justification. Rather, he points out that pragmatism, evidentialism and coherentism maintain properties that mistake truth for something else (1962:

224). However, it is found consistently that there is some allusion to experimental context in Popper's prescribed critical method of theory testing within which a conjecture corresponding to the relevant state of affairs is justified. Such a justification serves a conjecture right if it is severe enough to show the falsity of the belief if it were so. He puts it in the following words: "I do not know, I only guess. But I can examine my guess critically, and if it withstands severe criticism, then this fact may be taken as a good critical reason in favour of it" (Popper, 962:234). Popper (1962:248) writes again that whilst the inductivist pronounces verification instances as justification, the falsificationist looks up to severely tested conjectures regardless of how prone such conjectures are to fallibilism. In general, Popper's appeal to rigorous conjecture-validating process as a basis of justification is somewhat akin to reliabillist belief forming process. Corroborated beliefs are not true necessarily, they are reliable to the extent that they secure for Popper the elimination of false beliefs. For this reason, Popper (1962:112) avers that the theory that even stands the severest test is not even probable. It could however be suggested by critics that such a justification process is still vulnerable to what Sosa (1991) calls in his article *Knowledge in Perspective* "new evil demon argument". Ignoring for the moment the complications in various responses to the new evil demon argument, I hold the conviction that Popper's concession about the difficulty in acquiring doxastic falsifiers still holds. However, if the above deliberations suffice to properly characterize the epistemological underpinnings of Popper's methodology of science, then one is now at ease to dispel off some objections. The problem of empirical basis is

reasonably rebutted because the scientist could now carry a proposition as a viable falsifier as he is unperturbed by the stakes of epistemological demands. After all, knowledge is tentatively constructed and doxastic beliefs are admittedly unattainable. I conclude that Popper's falsificationism, aimed at generating reliable body of knowledge worthy to be labelled scientific beholds trustworthiness, which is all that could be claimed for it even in the face of the skeptical challenges.

Some critics have also noted, as was highlighted, that some principles or state of realities pose a major problem to falsificationism because such presentations cannot be falsified (I have in mind examples like the law of conservation of energy and dark matter). Relating to the issue of underdetermination, Geofrey-Smith has urged that even when a theory is falsified it is possible that the experimental procedure or some involving tools bear the problem for which reason the experimental procedure and not the theory in question is falsified. On the one hand, the challenge for falsificationism here relates to whether in the first place, one can be sure of possessing the requisite material tools necessary for determining the status of a falsifier. For example, take the hypothesis "light is the fastest moving substance". To falsify this claim, there should be an object that moves, at least in principle, faster than light. It could be that the instrument used in speed detection of physical quantities has for all this while defectively left out some evidence needed to change the outcome of the result. Contrary to what Popper admonishes, if the result is falsified, then instead

of rejecting the theory in question one might want to question the effectiveness of the instrument in use (Geofrey-Smith, 2003:64).

In answering the first hand criticism, a close analysis of *Conjectures and Refutations* is suggestive of at least two resolutions. First, Popper's writings suggest that future technological advances as well as further study and discoveries for some different purposes could bring to us a report of better particulars that will enable science practitioners to subject previous experiments (which current technological constraints make impossible to falsify) to review. After all, science presumes the interconnectedness of event, so one discovery could have links with other states of affairs. Popper's favourite example included the Columbus' discovery of America as a refutation of the earlier theory of flat earth (Popper, 1962: 221). To this, additional example relates to the circumstances surrounding the discovery of Neptune as a relevant example. The prediction of Newtonian mechanics, as it applies to the orbit of the planets was falsified by discoveries surrounding the orbit of Uranus. The calculations only took into account planets known at the time (Salmon et al, 1992:47). Neptune, which had not yet been observed but had been postulated by Leverrier to fill the gaps of the theory was later discovered leading to the corroboration on Newtonian mechanics. In fact, with the improvement in technology in 1967 when Joycelyn Bell's experimental set-up picked signals from objects emitting radio waves from the sky, Black holes whose existence had been a matter of huge controversy received some positive evidential support (Hawkings, 1989:98). On the other hand, principles which are immediately not testable could be used to generate further deductive

consequences which are ultimately testable. Let us focus on black holes as an example for the moment. Since Black holes are stars crumpled to a critical radius, a gravitational field so dense as incapable of allowing the emission of light from its surface is formed. Ipso facto, black holes were deemed unobservable and there was no hope of detecting it since its very nature does not permit the emission of light. However, the discourse of black holes has continued with lots of interesting revelations. These revelations have come by way of generating and testing some deductive consequences. For example, even though it generated initial skepticism, the notion of radiation emission from black holes was a bold prediction by Hawking. The conjecture, thanks to quantum mechanics, is now a credible hypothesis. Today, even though no prototype black hole has been discovered, it is agreed among scientists that if Black hole exists, then it ought to be shooting out X rays and Gamma rays (Hawking, 1989:85-103). The shooting of X rays and Gamma rays is by far clear observational instance that could serve the basis of falsificationist test. Unobservable entities may militate against, but does not completely shut the applicability fate of falsificationism.

Ansah (2015) suggests that the criterion of falsificationism is so loosely constructed that it could let in theories which would have been considered unscientific. Special mention is made of astrology, which Popper (1962) emphatically dismissed as unscientific. Ansah draws inspiration from Chalmers who provided an example from astrology meant to show that the discipline in question submits to falsification test despite its unscientific status. For the

purposes of comprehensive analysis, it is worthy to put forth Chalmers' example here:

> …while the horoscopes published in newspapers and journals do make falsifiable (as well as unfalsifiable) claims. The same "Your Stars" newspaper column that yielded the (unfalsifiable) prediction that "luck is possible in sporting speculation" also promised those whose birthday is on March 28 that "a new lover will put a sparkle in your eye and improve social activities"., a promise that is certainly falsifiable (Chalmers, 1999:99).

Billauer (2016:48) advances similar sentiment when he holds that falsificationism is no longer a tenable criterion of demarcation because astrology, which is not considered a science is indeed falsifiable.

The use of the scientific status of astrology against Popper's demarcation theory misfires for two main reasons. First of all, Chalmers himself has indicated that astrology puts forward falsifiable and unfalsiable claims. How then does he conclude that astrology in its entirety is scientific? What happens to the unfalsifiable claims as well? It is intelligible to say that some claims put forward by astrologers are scientific just as one can say that some claims from scientists are metaphysical. For example, when Newton is criticized for having introduced "occult" hands into science (Loose, 2001), or when he postulated divine first cause of living things (Engels, 2001:9) one does not, for the sake of Newton, convert the entirety of physics into metaphysics. Second, Popper's falsificationism, as espoused in the *Conjectures and Refutations* denied astrology entry into the sciences for the stated reason that "their interpretations and

prophecies (are) sufficiently vague (that) they were able to explain away anything that might have been a refutation of the theory had the theory and the prophecies been more precise" (Popper, 1962: 37). Let us grant a generous concession that Chalmers' example is actually falsifiable (as Ansah claimed it was falsified). However, it is not inconceivable that when it is falsified, phrases like "new lover", "putting spackles in one's eyes", "improve social activities" are subject to several interpretations that may boarder on whether such conditions have actually been fulfilled or not. If one grants that the said phrases are unambiguous phrases for which reason they can clearly meet the falsification criterion, then so be it, the claims in question are scientific. However, no matter how charitable one is in interpreting Chalmers' case example, it does not guarantee that all astrological claims are falsifiable unless all of such claims can pass the scrutiny of the falsification test. A similar response can be launched against Ansah's (2015:7) example that the creation story which suggests the age of the earth to be approximately six thousand years old is scientific because evidence of the predating lives of Dinosaurs is an occasion of the claim falsified. This example, Ansah believes, qualifies the creation story into the sciences in the light of the falsification criterion. This is yet another selective instance by which falsificationism is applicable to an isolated hypothesis. Yet Ansah, by suppressing evidences of other non-falsiable claims about the creation story, throws forwards the entirety of the creation story as if the entire claims of the creation story are consistent with the spirit of falsificationism. The creation story further makes many pronouncements, for example, that God commanded or fashioned things

into being, all of which overtly trample upon the boundaries of falsificationism. The methodological rule of falsificationism is not as wide as to allow the passage of all claims of the theories in question. Accordingly, the inference that these theories qualify as scientific on the basis that some of their claims are scientific is tantamount to committing the fallacy of composition. The fallacy of composition refers to an inference in which the properties associated with constituents are treated as essential properties of the whole as well (Ladyman, 2002:141).

Popper dismisses induction as unworthy basis for scientific theorizing for the reason that the riddle of induction is unsurmountable. Rothbarth (1980) reminds us of Popper's conviction that a theory gets corroborated by past experiences (Popper, 2002:10); a corroborated theory has only an explanatory power related to the past experimental results. Rothbarth reminder indicates that the complete rejection of induction by Popper means that one cannot have future expectation from scientific body of knowledge if falsificationism as a demarcation theory should replace induction. As such, Popper retorts that future expectation is actually possible on the basis of his hypothetico deductive method of.however, it stands to argue that a deduced prediction from a hypothesis in conjunction with statements of initial conditions suffice to give one a sense of future expectations. For example, if hypothesis A is deduced from universal statement Q and hence corroborated under conditions x, y, z, then one can anticipate that at least not-Q will not occur given circumstance x, y, z. Wesley fails to be convinced by this explanation because Popper's view, Wesley thinks, gives no reliable status to predictions churned out of falsificationism. Rothbarth (1980) holds that any

theorist who subscribes to Popperian hypothetico-deductive method could retort that induction is equally unjustified and no effort of inductivists, including Wesley himself have relieved induction from this gruesome burden. To get this criticism off the table, one is only to remind himself that the falsificationist, if he envisages future expectations from a corroborated thesis, does so for a "negative" reason. The negative reason is that in the falsificationist hypothetico-deductive method, the hypothesis out of which the prediction is made has not been shown to be false whereas an inductivist envisions expectations because of confirmational instances of previous tests. Popper (1962:192) alludes to Kant's claim that one learns to pose questions to nature and ought to expect negative answers. Popper's third rule of the falsificationist criteria explains the nature of negative answers expected from nature. He holds that a good scientific theory must forbid certain states of affairs from happening (Popper, 1962: 192). An example may be required here. Consider the hypothesis; all pieces of iron expand when heated. If such a hypothesis is corroborated then the hypothesis wills a prediction that prohibits the observational instance of any material to be called iron if it contracts when heated (Ansah, 2015:2). Accordingly, Popper's theory provides one with the basis for expecting that at least certain states of affairs will not happen under certain specified conditions; an iron will not contract when heated. The major point worthy of emphasis is that whereas induction envisages expectations based on positive evidence, falsificationism equally envisages future expectation, albeit, such expectations are anchored on "negative" hypotheses.

Feyerabend (1993) states that our knowledge of the world is so little that as many avenues as could serve knowledge construction ought to be welcomed. Again, he claims methodological rules are not in accord with cherished humanitarian virtues because abiding by such rules stifles individuality, liberty towards free thinking and personal ingenuity in knowledge construction. In the literature review, the study noted that these two main reasons are put forward by Feyerabend as a basis for rejecting prescriptive methodological rules for the sciences. On this basis, should one conclude that Popper's falsificationism is an unwanted methodological rule for the progress of science? Absolutely not!

Popper agrees with Feyerabend that one knows little about the universe which is why Popper regarded a corroborated theory as tentative. Popper says: "while what can in principle be so overthrown and yet resists all our critical efforts to do so may quite possibly be false, but is at any rate not unworthy of being seriously considered and perhaps even of being believed, though only tentatively" (Popper, 1962:228). If so, must one welcome knowledge without regards for the methodological exercise that gave rise to it as Feyerabend's second criticism does suggest? Feyerabend's second qualm may have to remind us that Popper, unlike the logical positivists, does not regard a body of knowledge meaningless, nonsensical or useless if it does not conform to a prescribed methodological rule. Popper dismisses the existence of any monopolistic avenues for seeking knowledge. He is of the view that all sources and suggestions are welcomed to the extent that they will be subjected to critical examination (Popper, 1962:27). For example, in relation to myths, they are useful to the extent that they

serve as an inspirational origins of scientific theories (1962: 257). Again, Popper says of metaphysics that it needs not be meaningless even though it fails to be scientific (1962:253). In spite of the fact that metaphysical claims are not opened to the test of falsification, Popper holds that Metaphysics is a requisite basis without which science cannot proceed. Popper's discourse on "metaphysical research programs" is intended to highlight this very point (Unah,1998:61). Falsificationism does not negate other sources of knowledge construction because they are incongruous with falsificationism. Accordingly, variant avenues of knowledge constructions are important so long as they serve as inspirational sources of generating hypothesis for the application of falsificationism.

Dialectical Materialism Versus Falsificationism

Duhem's argument from underdetermination relates to theoretical systems that make it impossible to isolate a hypothesis for the purposes of testing. Quine extends this argument to cover mathematics and logic as well. This position stems from one of the major philosophical doctrines of Quine's philosophy in general, which Parent called Revisability Doctrine. According to this doctrine, Quine holds that no theoretical system (formal logic inclusive) is exempted from revision (Parent, 2008:2-3). Popper rejected dialectical materialism as unfit basis for scientific theorizing on the grounds that its logical basis is flawed. Now, here one is faced with Quine's advocacy for possible revision of these fundamentals of logic. In chapter two, it is argued that the fundamental laws of logic cannot be replaced because their replacement will require the same ousted laws to validate the new one(s). The call of this study is that revision should therefore be seen as a

matter of extending the domains of formal logic to incorporate the laws of dialectics. This call is however inappropriate unless the laws of dialectics could be shown to be indeed falsifiable. Popper has said that the search for truth must begin with an enthusiastic search for error. Self-criticism is key for unravelling truth (Popper, 1962: 16). On Popper's own preferred theory of truth (correspondence theory of truth), for criticism to be truth aiming, it must correspond to the state of affairs. Thus, a valid cognitive process for grasping reality must obtain features to which criticisms from external reality is an intrinsic feature. Rightly so, Popper's falsificationism unseats dialectics from achieving corroboration status if nature fails to conform to the dialectical pattern: internal dynamism of society igniting never ending impulse of change. This is what is ordained by the triad of dialectics: thesis, antithesis and synthesis (Engels, 2001:9). Thus, if dialectics is said to be vested with scientific credentials, then it is so because it actually affirms the tenets of falsificationism, that is, the search for truth through the elimination of error.

The study concludes this chapter with what is perhaps Popper's breakthrough in the logic of methodological theorizing. Ansah discusses a number of Popper's importance in philosophy of science. First, since falsificationism thrives on modus tollens, Popper succeeds in mounting knowledge on a valid methodical foundation. Second, Popper's falsificationism breaks the methodological monopoly of induction as the logic of scientific discovery. Third, Popper's method is able to account for the progress of science (Ansah, 2015:12). All these remarkable achievements, I associate himself with. To these fascinating

marks another is added. Hume and other inductivists admonish cognitive agents to compromisingly stick with induction despite its logical inadequacies. Hume (2008:19) in particular felt it is the only guide for humanity in constructing knowledge, especially about the future. Popper, with his method of falsificationism, has fashioned out a deductive path to knowledge of the unknown. Stace criticizes logic in general, claiming that its ultimate principle may be regarded as "the law of consistency" (1972:341). For deductive logic, Stace (1972:345) holds that it is insufficient for proving truth. Perhaps the finest point of contact between falsificationism and the dialectical method relates to the view that there is no finality to the process of acquiring knowledge. Knowledge is not static (Wiredu, 1980:63). As a progressive adventure, knowledge therefore requires a cognitive framework that is open to the invasion of critical antithetical elements for the purposes of generating better results, which dialectics calls synthesis. Similarly, falsificationism upholds that a critical attitude and the use of deductive logic for knowledge construction is apt for generating truth verisimilitude.

CHAPTER FOUR

MARXISM VERSUS FALSIFICATIONISM: A PROOF OF THE SCIENTIFIC STATUS OF MARXISM

There are at least three ways open to the course of wanting to establish Marxism as a scientific theory on the basis of Popper's philosophical methodology of science. First, as required by the falsification criterion, it can be shown how Marxism could at least in principle pass a rigorous test intended as a falsifier. Second, one may set-up an experimental demonstration involving a falsification procedure of the core claims of Marxism. Third, one can dissociate Marxism from Orthodox interpretations (if there are any) intended to shield Marxian conjectures from refutations. The third approach relates to Popper's (1962:37) claim that Marx's formulations were falsifiable and indeed falsified. This means that Marxian formulations render Marxism a scientific theory, albeit, one which has been shown to be false. Recently, Bildt in his article *Why Marx Was Wrong* has expressed similar sentiment as he claimed that Marx's theory is rubbish, wrong and pragmatically dangerous. The problem however is that instead of regarding Marxism falsified, Popper says followers of Marx expanded the scope of Marxism in order to explain away refutation instances (Popper, 1962:37). Affecting the same side of the issue, Meyer's (1959:7) commentary suggests that the corruption of the worth of Marxism is as a result of the various explanatory attempts made by the disciples of Marxism to extend the discipline into natural science as well as philosophy. What this means is that the problem with the scientific status of Marxian philosophy as far as falsificationism is

concerned relates to those orthodox interpretations that shield the theory from having to be considered falsified. But when one dissociates these interpretations from Marxian formulations, the status of Marxism to be retained according to Popper is only a falsified theory, which according to the strict application of falsificationism, must lead to the rejection of the theory in question. It becomes part of obsolete scientific theories. It is on this basis that I channel the effort of this chapter to the examination of the basic statement(s) that supposedly falsifies/falsify the Marxian formulations regarding the socialist revolution. In the end, I contend that Orthodox Marxism is falsifiable but has not yet been falsified. If this is true, then, contrary to Popper's (1962: 37) concern, auxiliary statements are uncalled for. Consequently, Marxism's place as a scientific theory is unaffected. This is the aim of this chapter.

First of all, a prior notice must be given regarding how I generate the clear-cut conditions intended to serve as falsifiers of Orthodox Marxism. This move is necessary because in the statement of the problem, it is stated that these conditions are absent in *the Conjectures and Refutations*, a work in which Marxism is declared falsified. In the *Open Society and its Enemies,* Popper claimed that dialectics is so imprecise in a way that affords it the impunity to explain away its refutation instances. It is necessary to quote Popper on this matter: "Yet, of course, dialectics is sufficiently vague and adaptable to explain anything at all, and therefore a classless society also, as a dialectically necessary synthesis of an antithetical development" (1966:336). Another quotation of similar sentiment reads "…. His (Marx's) ambiguous historicist view of the social

revolution permitted him to interpret these reforms as its prelude or even as its beginning" (1966:352). In the *Conjectures and Refutations*, there are logical demonstrations to the effect that dialectics is antithetical and hence destructive to scientific theorizing. Now the question is if dialectics is really theorized in ambiguity and vagueness as Popper wants us to believe in the *Open Society and its Enemies*, then can Marxian formulations (which are based on the logic of dialectics) be falsified as Popper claimed in the *Conjectures and Refutations*? The obvious answer is no, unless one determines beforehand what the ambiguous and vague writing is supposed to mean. One must again note that Popper (1962: 37) has declared that until Marx's disciples adapted the theory to auxiliary statements that destroyed its openness to the falsification criterion, Marxian formulations were scientific. According to the falsificationist criterion briefly stated, if a theory is scientific, then it should be falsifiable. Thus, if Marxian formulations are hailed by Popper as being scientific, then Marxism is indeed falsifiable. But the claim that Marxism is falsifiable presupposes the existence of some clear-cut conditions according to which Popper deems Marxian formulations falsified, even when such conditions are absent in the *Conjectures and Refutations*. This is the justification for considering some passages in his later work, the *Open Society and its Enemies* (1962:344ff) as the missing conditions (from the *Conjectures and Refutations*) which Popper submit as falsifiers of Marxian formulations.

According to Popper, a theory may appeal to observation and still lack the sort of evidence necessary to render it empirically evidential in terms of scientific standards (Popper, 1962:37). This was further demonstrated with Anthony Flew's

thought experiment as shown in chapter three. Thus, even though not a sufficient condition, empirical observation is a necessary pillar for formulating every scientific theory. If Marxism is to be considered a candidate of scientific theory, then, the least one could expect from it is that the analysis of Marxian object of study should first of all fit the adequacy of empirical standards. Marxism achieves the concretization of social relations through the identification of matter as the primary reality. Russell (1945:785) says of Marxian materialism that it is not bare or dehumanized Aristotelian matter but the specific ways and conditions under which man produces his basic needs. Marx (2010:31) calls this the "first premise" which he says can be subjected to empirical verification. Thus Marx achieves the augmentation of his theory to empirical standards by manumitting social relations from Hegelian Metaphysical discourse (regarding the Absolute Spirit) and giving it a new lifeline whose power button is economics.

However, as Marxism identifies economic social realities as a basis for augmenting the standards of empirical adequacy, Marxism encounters another challenge relating to how it can qualify as a natural science. Social relations, like food web, have been criticized for being non-substantial and hence unfit basis for scientific theorizing. This criticism finds expression in what is noted as the argument from meaningfulness. The criticism suggests that social relation is not any piece of natural object but a creation of human beings and hence cannot be strictly subjected to scientific studies (Levinson, 1982:90). Take for example, food web relation between a grasshopper, lizard and a snake. The lizard eats the grasshopper and the lizard is eaten by the snake. But the relation of "the lizard

eating the grasshopper" or "the lizard being eaten by the snake" is not any substance in the same way that one could say a stone or a serpent is a substance. The relation is an intentional state of one animal whose belief it is that its prey ought to serve the predator as food. Some scholars following Winch have used similar lines of thought to discredit social sciences, claiming that it does not bear the same features as the natural sciences. The crux of their argument is that social science cannot explain actions devoid of intentions and social norms. Since these intentions are governed by reasons and reasons are not susceptible to causal explanations, social sciences cannot operate in the same way that the natural sciences operate (Sakar & Pfeifer, 2006: xxiv). Similarly, other issues raised against the empirical aspect of Marxism include the suggestion that Marx's theory is not even concerned with nature, let alone to have a substantial basis for scientific theorizing (Sheehan, 1993:50). A Similar idea has been advanced by Giddens who holds that studying human relation cannot be likened to events of the physical world. He further states that social life cannot be accurately captured because of hindrances coming from complex presuppositions that inform human behaviour (Giddens, 2006:78). The bottom line is that human relations consist basically in interactions between minds. But minds are not reliably predictable in terms of correspondence to ways of life or behaviour as one could predict experiments about inanimate quantities like sodium chloride (Osei, 2006:94). Thus, relations among minds are not "rich" ingredients for formulating reliable theories worthy of the label natural science.

The study put behind readers the quest to categorize and defend Marxism as part of either social science or natural science. What I boldly defend is that the details of Marxism are richer than mere social relations between minds. And this rich ingredients of social relations peculiar to Marxism does not only open the theory up for the application of falsificationism but they also show Marxism's close affinity with physical theories of the natural sciences. In Marxian dialectics, a mental process is construed as a superior stage of development in matter (Lewis, 1982). Popper (1962:303) holds that even though Marx speaks of the mind as if it is identical to the brain, in practice, they are different. Even though one subscribes to the position that there is some sort of vagueness regarding Marxian conception of mind, Engels is of crucial help in deciding such matters. According to Engels (1997:24), mind is another word for matter. It is a function of the brain. It is the energy the brain acquires to perform its function after the brain has met its need for food. This way of looking at the mind (as another form of matter) yields the conclusion that "mind" too must obey the laws of nature as expressed in the triad of dialectics. In this way, Marx provides a bridge between mental phenomenon and the physical world. Marx concretizes the former as an observable link between human persons on the one hand and the way humans produce their needs on the other hand. Thus, in the material world, all subjective experiences are emptied into objects of the external world and this constitutes the material conditions under which man lives. If one supplements the above with Engels' further claims of all things (including the mode of production) being guided by specific determinable laws of the dialectic triad, then Orthodox

Marxism seems to be advancing some form of theoretical reductionism that empties social relations into physical science. What is important is that the application of conceptual reductionism in concretizing social relations under mode of production is an important success by Marx, according to which Marx manumits Marxism from being trapped by the argument of meaningfulness.

Even though observation is unavoidably important in scientific enquiry, according to Popper (1962:33), a pseudo empirical approach imbibes multiple observational instances set to only confirm rather than refute the theory in question. Thus, even though Marxism appeals to observation as required per the standards of scientific theory, further elucidation is required to make clear how Marxism specifically departs from pseudo-scientific theories. Accordingly, attention must be directed to the empirical components of Marxism. The following analysis is intended also to examine the falsification status of the said components of Marxism, all in the interest of determining whether such components have been falsified or not.

In Engel's Speech at Marx's graveside, Engels attributes to Marx the discovery that the basic needs of mankind are prior to the formation of thought, for which reason thought must be explained in terms of the production of material needs (Lepore, 1993). From this, one generates the universal statement that "If there is a society made up of thinking people then that society fends for its material needs. For without fending for its material needs, no thought process could occur in that society". To falsify this claim, one formulates the falsifier in accordance with Popper's characterization of basic falsifying statements: "There

are societies made up of thinking people who do not primarily fend for their material needs". The falsity of this falsifying statement is made self-evident since all living things necessarily owe to themselves the capacity for nutrition. Marxism clearly takes off from not only a falsifiable hypothesis, but a corroborated one indeed.

According to Engels (1999:192), the necessity of this initial condition establishes a social relation characterized by common ownership of the means of production and the collectivization of the productive process. This mode of production, primitive as it were and the first beginning of all societies is called communalism. The first of the dialectical triad is established, a thesis. Accordingly, the law of transformation of quantity into quality readily takes effect and ushers the communal state into slavery. As shown earlier, since the inception of slavery, the mode of production of history has essentially been characterized by the exploitation of man by man. Devoid of socialist organizational structure, any agent, given that these agents are human persons, are either exploiting someone or they are themselves being exploited. On the basis of dialectical drive, Marx envisions that the next mode of production following the negation of exploitation is the communist state (*Communist Manifesto).* Following the communist state, possession of the means of production shall be on co-operative basis with the emergence of a classless state. Although the revolutionary transition from slavery into communism will not necessarily be engendered by civil war between the proletariats and the bourgeoisie, it is however highly improbable that such a war is avoidable (Popper, 1966: 347).

From the projection of the communist state based on dialectics, Popper deduces a number of testable consequences which must now engage our attention. The technique is as follows: a conditional statement is put foward with the truth of dialectics as the antecedent and the communist revolution as a deduced consequent. According to Popper's recommended modus tollens rule for theory testing, if the consequent is proven false, the antecedent (dialectics) is likewise falsified. Popper holds that the character of the communist revolution is falsified which according to the logical Modus Ponens yardstick, indicates the falsification of dialectics. Now, Popper regards a number of Marxian hypothesis as false. And so put together, Popper regards the said hypotheses as having falsified the communist revolution in particular and dialectics in general. The study now evaluates these hypotheses individually.

Marx claims that the communist revolution will bring about a classless society (*The Communist Manifesto)*. Popper contends that granted that the communist revolution could actually occur, it is still false to regard such a state begetting a classless population of individuals or an enduring non exploitative state. The reason being that their class unity may cease once the struggle for success is over and consequent disintegration could turn the society back into class stratifications. Popper realizes that the nature of dialectical progression hinges on endless cycle of development. Marx calls the process dialectical because as Russell (1945:775) points out "it (the knowledge process) is never fully completed". For this reason, dialectics by its very nature readily permits the generation of antithetical elements in the form of class struggle again.

Consequently, dialectics is fairly consistent with the very deductions intended as a falsification of the thesis. Instead of considering the criticism answered, Popper accuses dialectics of vagueness, a logical basis adapted to explain away instances that could refute it. As pointed out earlier, a logical basis said to be vague cannot be falsified because vagueness is intrinsically defined by lack of clear-cut boarder lines by which the hypothesis in question could be said to apply. And if Marxism is believed to have been falsified (Popper 1962:37) then its accusation of being vague is questionable. Accordingly, not only does Popper's criticism fly in the face of consistency, it is a self-refuting argument.

According to Marx, the destruction of the capitalist mode of production is necessarily followed by a new thesis, the socialist system of production *(Communist Manifesto).* Contrary to Marx's view, Popper claims that (introducing the falsifier) a communist state is not a necessary successor of a capitalist state. Popper holds that unrestrained capitalism has given way to new historical epoch, marked by some political interventionist programs which are compatible with socialism. These interventionist programs include the Russian reforms, fascist form of totalitarianism and democratic interventions of England, USA, and other smaller democracies led by Sweden. Popper's conclusion is that these historical antecedents, marked by alternative reform programs following downtrodden capitalist mode of production clearly falsify Marxian prophecy (Popper, 1966: 339).

If Popper is right, then, by extension, dialectics is falsified. This is so because Marx used dialectics to point history in a particular direction of

development which should see a necessary succession of capitalism by communism. But here is Popper advancing the thesis that socialism could be achieved as reforms without necessarily overthrowing capitalism. These reforms Popper regards as socialists' are exemplification of Marx's own identified features of a socialist state. On the one hand, Popper's evidence in support of his claim is a suppressed one. The ten point conditions (Popper, 1966:339) which he picks from Marxian literatures are indisputably necessary conditions for socialist systems. However, the set of conditions leave behind the importance of the most crucial characteristics of a socialist system. The study has discussed the concept of revolution extensively (in chapter two of this work) as regards its essential feature of the destruction of private ownership of the means of production. In the absence of this crucial event, there is no communist revolution in the Marxian sense. Restructuring of state power, either by chaotic reconstitution or bloodless elimination of state power could take place and even though socialist reforms could ensue afterwards, it is wrong to describe the resulting mode of production as a socialist one. Only recently, says Smith (2003:1), has attention been paid to this misnomer. Revolution in the Marxian sense is indicative of the change in the ownership of the means of production. It is for this reason that Marx deems the summary of the communist theory as "abolishing of private property" (*Communist Manifesto*). The only way of establishing socialism qua socialism is in the words of Taylor (1908:12) "abolishing private monopoly of the instruments of wealth". In fact, Engels (1997) labels the Marxian version of socialism scientific because it distinguishes itself from pre-Marxian socialism by focusing

our attention in a way that no other theory has done before, on the specific way by which private ownership of the means of production works to obfuscate the achievement of economic equality. Thus, if one takes serious the complete extinction of private ownership of the means of production as the core defining principle of a socialist state, then one destroys the compatibility of socialist reforms with capitalist state. By associating the march towards socialism with logical analysis of exterminating private control over the mode of production, Marxian formulations set dialectics on clearly falsifiable podium and hence scientific.

Marx says that the private monopolization of the means of production leads to a transformation process that intensifies mass misery, slavery, oppression and exploitation, all on the part of the proletariat. The socio-economic gap between the owners of the means of production and the workers breed social unrest and fosters class consciousness in the form of an organized united force. The consequent is the explosion of the capitalist integument caused by the unified aggressive proletariats (Capital, 2015:542). Popper's criticism begins with the qualm that Marx's class distinction applies to the world of industrial workers. Popper holds that on the part of the proletariats, the false dichotomy of proletariat-bourgeoisie distinction leaves open the direction of allegiance of other classes amidst the rise of misery. He says that there is at least a possibility of division and that the agricultural worker might sometimes be too dependent on the bourgeoisie leading to the formation of common associations. Popper says, "But that farmers or peasants may easily choose to support the bourgeoisie rather than the workers

was mentioned by Marx himself" (Popper, 1962:345). It is true that Marx defines the proletariats as industrialist wage workers (Kautsky, 2000). According to this definition, some middle class associates like agricultural workers are not necessarily expected to be industrial wage workers and hence are not in the proletariat class. But again, Marx (in the *Communist Manifesto)* acknowledges that the proletariat does not own means of production, which is the basis for which the proletariat class gets exploited. This is especially true if one takes his definition as provided in Engels' letter to Joseph Bloch serious. In there, the proletariat is spoken of as "that class in society which lives entirely from the sale of its labour power and does not draw profit from any kind of capital…" (Engels, 1980). If the absence of ownership of resources is taken to be an essential feature of being a proletariat, then all other classes are reducible to the bourgeoisie-proletariat dichotomy, which is why Marx regards the proletariat class as a culmination of all the middle class. For he says, "The other classes decay and finally disappear in the face of modern industry; the proletariat is its special and essential product" *(Communist Manifesto).* The artisan, peasant, and small scale manufacturer including Popper's own examples are all either owners of means of production or they are not. Analyzing class distinctions this way whittles away the existence of the middle class. Now, if one is a proletariat, then one is necessarily exploited, for as Kautsky (2000:18) said, "the wages of the workmen can never rise high enough to put an end to the exploitation of labour". Under what circumstances therefore will the proletariat class direct their allegiance to the bourgeoisie? According to Popper this can only take place if the proletariat class

are highly dependent on the bourgeoisie. But this is however only true if the proletariat does not recognize that his condition under communism will be better than depending on the goodwill of the bourgeoisie. Hence, Popper's critical analysis is not fully completed and hence inadequate, unless it is shown that the proletariat economic condition will worsen without having to depend on the bourgeoisie class.

According to Popper, in the event of defeatism befalling the proletariat class in the revolutionary contention, a possible outcome is a compromise or breakdown of the unified force of the proletariat class (1962, 346). The defeatism of the proletariat is supported by Popper's later claim that nothing prevents the bourgeoisie class from initiating the conflict, by which the bourgeoisies' prior preparedness could make them victorious. Why, Popper (1962: 357) queries, would they (bourgeoisie) have to wait for the proletariat to pursue aggression before beginning to fight back? The crux of this criticism is that contrary to the thinking of Marx that the proletariat will surely be victorious, the possibility of defeat befalling the said class narrows (if not closes) the chance of establishing a communist state in the course of revolutionary struggle.

Orthodox Marxism offers at least two main independent premises, both hailing the necessity of victory on the part of the proletariats. First is the provisions of the laws of dialectics. In accordance with the classic covering law model of explanation, an explanadum (in this case the reality of the social revolution) is a product of general laws and background assumptions (Boyd, Gasper & Trout, 1991:291). The first law of dialectics demands from a prevailing

quantitative thesis, a transformation into a qualitative thesis (Engels, 2001:18). Since capitalism is the prevailing thesis, it cannot change into another thesis marked by exploitation of man by man, otherwise there is no real qualitative change. Thus, the truth of dialectics, if granted, puts it beyond doubt that the proletariats will ultimately emerge winners even if some successive losses are initially incurred. The invocation of dialectical laws in support of the scientificity of Marxism is in accord with the covering model of scientific explanation. This model of explanation requires the specification of laws and initial conditions if a phenomenon is to be covered under scientific explanation. Critics of social science have denied the veracity of the usefulness of laws, if they exist in the first place, as far as social science is concerned. They argue that because such laws, if they exist, thrive on ceteris paribus clauses, the social sciences are essentially incompatible with the natural sciences (Sakar &Pfeifer 2006: xxiii). Here also Marxism shows itself to be much closer to the domain of the natural sciences since it departs from such limitation. But because the invocation of the laws of dialectics to prove the scientificity of dialectics is a vicious circular reasoning, the study must establish beforehand, some further proof of dialectics. Engels (1996:20) holds that nature is the evidence for the truth of dialectics. In this way, if one wants proof of dialectics, the workings of nature must be the window for such discovery.

Since the inception of the industrial revolution, capitalism has driven the development of technology into mass destructive and oppressive instruments of mankind. London and Manchester have witnessed social misery as implied by the

gruesome habitation slums of the 19th century. Slavery was resuscitated in America following the introduction of cotton gin production. Nuclear fission technology has made real the possibility of decimating the entire human societies and airplanes have been converted into mass explosive devices for killing countless number of people (Damon, 2018).

Recent changes in market labour, punctuated by rising youth unemployment have shifted the phenomenon to the top of the political agenda across the globe, forcing the phenomenon into one of the worse global crisis of contemporary times (Albaek, et al, 2015). In the United Kingdom where the recession is said to have deepened since 2009, nearly two million people have emerged unemployed between the years 2000 and 2008 (Bell & Blanchflower, 2009). In Africa where youth population is set to increase to about 830 million by 2050, unemployment in Northern Africa alone was 29.3 percent in 2016. In South Africa, more than half of the active youth were estimated to be unemployed by 2016, representing the highest youth unemployment rate in the region (International Labour Organization Report, 2016). In Ghana, about 1,250,913 persons categorized within the youth force (15 years and older) are estimated to be unemployed, representing an unemployment rate of 11.9 percent. It is estimated by the International Labour Organization that unemployment among the youth is bound to increase between 2015 to 2017 from 12.9 percent to 13.1 percent (World Employment Social Outlook, 2016). The income distribution levels across the globe is indicative of a relationship between unemployment and poverty. In 1998, 25 percent of the world's population were earning 75 percent of

world income total (Milanovic, 1999). In Africa, almost half of the population is said to live in extreme poverty (Mensah, Enu-Kwesi &Akorsu, 1998). By 2007, 94 percent of the world's income went to 40 percent of the world's population, leaving the remaining 6 percent income budget to be shared among the 60 percent. According to Yunus (2007) over 1 billion people live on less than one dollar per day, representing a population stricken by extreme poverty.

More troubles are being caused by capitalism as Artificial Intelligence takes the center stage in industrial operations. The fusion of AI with robotics has accomplished computer works, rendering countless of human resource unemployed across fields like building and construction, food production and others. Oxford University survey of 2013 indicates that nearly half of the jobs in United States of America will be displaced by AI and robotics in the next 20 years alone (Damon, 2018). The worrisome uprise of human labour redundancy caused by robotics is seen from the way many trending articles on global issues allude to this fact of which Lee Jong-Wha's article: *Making the Most of Asia's Aging Populations (*May 29, 2018) is no exception. The phenomena so far ring the bell of a clearer indication regarding the widening gap, as the bourgeoisie class continues to consolidate their wealth.

So nature is telling us that the dictates of dialectics, "that there will be a tendency towards an increase of wealth and misery; of wealth in the ruling class, the bourgeoisie, and of misery in the ruled class, the workers" is true (Popper, 1962:335). In accordance with falsificationism, I submit that the realization of progressive socio-economic circumstances or even a stabilized economic growth

across the globe will not only serve as a falsifier of the projections of dialectics, it actually will falsify Marxism. In the absence of such progressive economic conditions across the globe, dialectics (and Marxism by extension) is shown not only to be falsifiable but also yet unfalsified.

The second reason is somewhat an inference. Marx does not say that numerical advantage of "foot soldiers" necessarily guarantees proletariat victory. Nonetheless, some allusions to "numbers" do suggest that it plays to the advantage of the proletariat in terms of which class emerges victorious. Marx wrote: "But with the development of industry, the proletariat not only increases in number; it becomes concentrated in greater masses, its strength grows, and it feels that strength more" *(Communist Manifesto).* He says in the same literature that the result of the struggle lies in the continual increasing numbers of the workers' union. Kautsky (2000: 169) also mentions that the proletariat victory is inevitable since the class of proletariats grows in consciousness, enthusiasm and numbers. Again, Marx (1999: 12) calls the proletariat a revolutionary class since their strength increases with the expansion of large scale industries. However, it is also true that victory cannot be secured on the basis of mere numbers. In fact, the bourgeoisie, in virtue of their wealth, could better secure advanced technological ammunition that could render the proletariat numbers useless. This is particularly true if they suspect ahead of time the coming of the revolution and decide to lay preparations ahead.

Perhaps the interesting reason that runs counter to Popper's analysis of proletariat defeat is well articulated in the argument from "the necessity of the

proletariat victory" and has its basis expressed by Popper (1962) himself. Here, the argument will be detailed further with greater logical force. The process begins by assuming the truth of the view to be disproved: the victory of the bourgeoisie class. This state of affair is premised as an antecedent. Consequences which are inconsistent with the upheld thesis (bourgeoisie victory) shall be adduced and the success of this deduction should nullify the plausibility of the antecedent. In the event that the bourgeoisie class emerges victorious, the possible states of affairs are (i) as it were, the bourgeoisie class will continue to exploit and sustain their livelihood on the surplus value to be produced by the enslaved proletariat. (ii) The bourgeoisie will eliminate the proletariat and hence individually produce for their (bourgeoisie) own needs. (iii) The bourgeoisie will eliminate the proletariat and some bourgeoisies by whichever means will assume dominion and convert fellow bourgeoisie into the working class. If by falsification of the communist revolution one means a defeat of the proletariat, then option (i) cannot falsify the proletariat victory. It may only delay it. The proletariats class will grow in strength and class consciousness again and again until the next stage of dialectics is borne. Trotsky (1942: 170) observes, "But socialist production must, and will, come. Its victory will have become inevitable as soon as that of the proletariat has become inevitable. The working-class will naturally strive to put an end to exploitation…".

Trotsky's quote is suggestive of the surety that as long as the proletariats class prevails, one cannot but to expect a victory on their part. Thus, at best, option (i) can only delay the revolution. Option (ii) implicitly assumes that the

bourgeoisie would want to survive and preserve his existence otherwise it is not necessary to produce material needs in the absence of the proletariat. Again this state of affair is inconsistent with the vision and mission of the bourgeoisie class for two main reasons. In Darwin's theory of evolution, it is the fittest organism that survives evolution. However, survival of the fittest does not imply the non-existence of unfit organisms because the fittest organisms need the unfit ones as preys by which the fittest will survive. Thus, the predators offset the balance and risk extinction if they likewise render their preys extinct. Similarly, in the event of revolutionary clash, the bourgeoisie risks extinction if they eliminate the proletariat from whose labour the bourgeoisie earns his livelihood. But if the bourgeoisie substitutes his own labour power in the productive process, then it breeches the social nature of production at the cost of producing at subsistence level. In the absence of the proletariat, socio-economic circumstances will be marked by lack of competition and exploitation (Engdahl & Dunne, 1925:6). But without exploitation, the bourgeoisie is deprived of their cap as a propertied class because his ownership of the means of production becomes nothing more than just a label since he can only produce at the level of subsistence. The relation finds articulation in the second law of dialectics: interpenetration of opposites. This law avers that any variable constituting a thesis cannot subsist independently in the complete absence of some antithetical elements with which the thesis combines to instantiate a contradiction. In effect, whilst the proletariat cannot exist without selling of his labour time to the bourgeoisie, the bourgeoisie can likewise not

exist without exploiting labour (Shirokov, 1990:134, Engels, 1997:20). It is therefore inconsistent for the bourgeoisie to retain its identity as a bourgeoisie and win the revolution by eliminating the proletariat class. This leads us into option (iii). Popper (1962) states that even if the proletariats emerge victorious, they could evolve into another class stratification with some members assuming the bourgeoisie sooner or later. This logic is equally applicable to the victory of the bourgeoisies. In the event of bourgeoisies' victory, the productive forces gap created will have to be filled by the conversion of some bourgeoisie into the proletariat class to produce basic needs for sustaining the bourgeoisies' livelihood. Again, this can only delay the Communist Revolution because sooner or later, misery will ignite unity and class consciousness in the new proletariat converts, as it were, to seek for equality and social justice. Rightly so because for Marx, an existential class worthy of retaining proletariats' label stands for one thing, a revolution. For he says "Of all the classes that stand face to face with the bourgeoisie today, the proletariat alone is a really revolutionary class" *(Communist Manifesto).* What prevails here now is a real dilemma, a communist specter haunting the bourgeoisie class at all angles. The only option for the bourgeoisie, premised on Popper's own admission, is therefore to prolong their inevitable defeat (Popper, 1962: 337). Marx's popular claim that "the victory of the proletariat is equally inevitable" as well as other frequent usage of "inevitability" to characterize the coming of the revolution is not only shown to be true but also a necessary deductive

consequence from the existence of proletariat exploitation (Kautsky, 2000: 171).

Wiredu is of the view that a number of issues inherent in Marxian prophecies suffice to render Marxism practically untenable. He says, "where in the world, I ask, is there any form of social organization remotely resembling this ideal (the communist world) picture?" (1980:90). His commentary indicates that the basis upon which the conclusion (as expressed by the quotation in the previous paragraph) rests is not a possible state of affairs and hence falsifies Marxian prophecies. Focusing on selections from Wiredu's literature, I submit for critical review some other bulk of falsifying conditions. All the provisions (1-4) are easily convertible to basic existential statements according to Popper's classification of falsifiers as spelt out in *The Logic of Scientific Discovery.* They are hereby presented as basic existential falsifiers.

1. There will be no economic classes as well as class antagonism
2. There will be no political power and hence no government
3. Production will be run by co-operative effort: for the good of society, according to a social plan;
4. There will be no division of labour (Wiredu, 1980:90).

Condition (1) has already been addressed when one alluded to dialectics as a method of enquiry whose objects of study are never fully completed in self-actualization as expressed by Russell. Thus, any given thesis retains some remnants of the previous thesis which is necessary for initiating a contradiction for the next phase of development. For this reason, the claim that there will be no

economic classes as well as class antagonism evolving afterwards freezes the object of dialectical studies and is hereby pronounced as running counter to the core claim of dialectics: the constancy of change. Wiredu's formulation of condition (2) seem to conflate two concepts; political power and Marx's conception of state. For Marx, the state is an arbiter, albeit with a special interest of suppressing open conflict between two antagonistic classes which is why Engels wrote:

> It (state) is a product of society at a certain stage of development; it is the admission that this society has become entangled in an insoluble contradiction with itself, that it has split into irreconcilable opposites which it is powerless to exorcise. But in order that these opposites, classes with conflicting economic interests, shall not consume themselves and society in fruitless struggle, it became necessary to have a power seemingly standing above society that would moderate the conflict and keep it within the bounds of "order"; and this power, arising out of society but placing itself above it and alienating itself more and more from it, is the state (1999:206-207).

Thus, it is inappropriate to label every power a "state" unless it is organized in a manner to perpetuate economic inequality by stabilizing the tendency of open conflict. What Marxism envisions under the communist state is the abolishing of this kind of power. However, to say this does not suggest that there will be no kind of organized body mandated to administer the state of affairs under the communist state. Since there will be no inequality, what will be administered are things and not men (Marx, 2010) and what is it that will administer these things if

not a constitution of a governing body? A specific example is drawn from the Russian revolution of 1917. The abdication of the Tsarist regime was also followed by the abdication of the political power they wielded. Nonetheless, factory committees were set up comprising workers and in some cases people of the old administration were drawn to manage the new mode of production (Smith, 2003:61). Thus, government will not wither away under the communist state but the organization of government will have a peculiar structure, which is workers' control of production. Condition (2) is therefore not a "dream" world and therefore cannot be used to condemn Marxism under the label of utopianism. As revealed by the foregoing analysis, condition (3) is a necessary consequence of condition (2) and one should therefore try to say nothing more about it.

It is now time to deal with condition (4). As industries continue to expand and compete among themselves, profit can be maximized through the efficient utilization of labour power at a relatively cheaper price as much as possible. Labour efficiency is better improved in the process of division of labour since a singular task assigned to labour over time perfects his competence as specialist over such duties (Capital, 2015). In the competitive labour market, division of labour sets individuals against each other as each individual seeks to perfect his productive skills over a specific sphere of production. The resulting contradiction ensues between individual self-interest and the interest of the common good. As the competition heightens (due to the growth of productive forces), labour loses himself in the process and is reduced to a mechanical component of the tools of production, which is where the first form of alienation arises. In Amazon

warehouses, artificial intelligence unit is engaged to exercise oversight responsibility concerning the movement of workers. Report signals are sent to foremen when workers take some time off their continues work routine to take some breath. Similarly, Uber companies are using artificial intelligence to persistently cushion employee drivers to work even to the detriment of their health (Damon, 2018). Here prevails labour assuming an extended conscious part of the productive tools owned by the capitalist. Thornes has captured the nature of this alienation as follows:

> The nature of work in the capitalist society is that people are required to specialize, in order to be more efficient. This division of labour means that workers must perform a limited range of repetitive tasks. At work, they can only function in a limited way and realize a one sided, crippled development, instead of expressing the whole of their individuality and self-realization. They are alienated from the satisfaction of their full potential and self-realization (2008:169).

Marx and Engels (2010:46) compare division of labour to Graeco-Roman classical family duties of the children and wife. This analogy exposes division of labour as an inseparable ally of private ownership of the means of production. Thus, communism envisions that the end of private ownership of the means of production will allow the consequent mode of production to denounce defining individuals as merely extended conscious accessories of machines. According to Mboya (1963:611) therefore "the working man no longer feels free except in his animal functions; eating, drinking and procreating" and the satisfaction of these needs, he says, the proletariat mistakenly assume as the basic purpose of life when

in actual fact, it is supposed to be the means to it. Thus, when communism is said to abolish division of labour, what is meant is an emancipation from having sold one's freedom to a fixed and unvarying labour conditions. This interpretation is exemplified here:

> (With division of labour) He (labour) is a hunter, a fisherman, a shepherd, or a critical critic, and must remain so if he does not want to lose his means of livelihood; whereas in communist society, where nobody has one exclusive sphere of activity but each can become accomplished in any branch he wishes, society regulates the general production and thus makes it possible for me to do one thing today and another tomorrow, to hunt in the morning, fish in the afternoon, rear cattle in the evening, criticize after dinner, just as I have a mind, without ever becoming hunter, fisherman, shepherd or critic (Marx & Engels, 2010:47).

This is not to suggest that communism is committed to killing the development of expertise over a sphere of influence. It upholds the evolvement of a kind of labour population capable of diversifying their expertise to various fields of production in a way that promotes the self-dignity of labour not as a means to an end but as an end in himself (labour).

Again, some doubts have also been raised about the feasibility communism. This belief is anchored on the Marxian stipulation that: (6) there will be no families (in communist state) (Marx & Engels, 2010). Provisions (6) is vulnerable to easy misinterpretations, which is why it may be regarded unrealistic

and hence utopian. Kautsky (2000:112) for example regarded condition (6) as widespread prejudice which takes (only) a fool to imagine that the concept of family life can be created or dissipated by some pronouncements. An interpretation of the said formulations is therefore needed in the Marxian sense, otherwise ensuing misconceptions could be used to judge Marxism as having been falsified as far as the Russian revolution is concerned. Provision (6) has close ties with readings from *German Ideology*. Here, Marx speaks of the abolishing of the family as accompanying the establishment of the communist regime. However, the concept of family which Marx anticipated its dismissal corresponds to some specific social relations that ought to be rightly interpreted. As a social institution, Engels deemed the concept of marriage, which is where the concept of family begins, as a superstructure which, like all forms of superstructure, owes its beginning to property relations. In group marriage of ancient times, one cannot determine the father of a child with certainty as compared to determining the mother of the child. It was therefore necessary to prove descent from the mother's side. Now, owing to the problem of inheriting male property, group marriage was to be limited to polygyny according to which the right of inheritance by children could be easily traceable to a specific father (Engels, 1999). In this way, marriage, like any other social institutions, reveals its emergence and close alliance to property relations. Marx and Engels affirm a necessary relationship between family and property relations as he claimed that "…because the existence of the family is made necessary by its connection with the mode of production, which exists independently of the will of bourgeois

society" (2010:181). As such it (family) works to be defensive and to perpetuate the existing mode of production from which it emerged. Marx and Engels write:

> But marriage, property, the family remain untouched in theory, because they are the practical basis on which the bourgeoisie has directed its domination, and because in their bourgeois form they are the conditions which make the bourgeois a bourgeois, just as the constantly evaded law makes the religious Jew a religious Jew (2010:180).

Marx's argument is clear. If the concept of family is to be explained from its relationship with property relations, then a dissolution of property relations (in the communist regime) inevitably leads to the withering away of the family. This is rightly so because the communist regime is supposed to bring about the removal of all the conditions of exploitation. So the concept of family that works to perpetuate private ownership of the means of production will no longer exist. The functionalist approach to understanding social institutions holds that every institution exists because it plays a functional role in the society, and that if its role is dysfunctional, it will die off naturally all by itself (Kumar, 2011). Marx and Engels (2010) makes implicit suggestions about the need not to misconstrue the dissolution of familyhood as the withering away of close affections among people associated by blood. While the older communist association borne the motto "All men are brothers" Marx thought men are either suffering of exploitation or agents of exploitation (Taylor, 1908:59). What Marx did was to substitute family affection based on blood relations with family affections based

on classless associations. According to this Marxian sense of familyhood, communism envisions a society characterized by a situation whereby "the free development of each is the condition for the free development of all" (Communist Manifesto). Far from dissolving family ties, Marxism induces a wider application of "family", which thrives not on ethnic, racial, gender or national ties but on one's place within the spectrum of property relations. Thus if the claim that there will be no family is put into the right Marxian perspective according to Marx's own literature, then the claim is not only feasible, it is yet to be falsified.

The Russian Phenomenon of 1917: A Case of Marxism Falsified?

Popper suggests as one of his key evidence that the Russian revolution of 1917 falsifies Marxism. This is clearly captured in the statement of the problem as stated in chapter one and supported by a text from the *Conjectures and Refutation* (1962:37). This is why the phenomenon under discussion deserves special treatment. Popper's criticism tends to remind us of Bildt's allusion to Popper as Popper calls Marx a "false prophet". *In the Open Society and its Enemies,* Popper's premises are summarized succinctly in the following passage:

> I judge them (Marxists) by their own standard, by Marxism; for according to Marxism, the proletarian revolution should have been the final outcome of industrialization, and not vice versa; and it should have come first in the highly industrialized countries, and only much later in Russia (1966:342).

The obvious conclusion is that the Russian phenomenon of 1917 has missed the nature of Marx's own anticipated revolution and hence Marxism is falsified. In support of Popper, Kenny (2010: 973) also writes: "If Marx's hypothesis had been correct, revolution would have occurred soonest in those states in which technology, and therefore exploitation, was progressing fastest. In fact, the first communist revolution occurred in backward Russia …"

In recent times, the claim that Marxism is both rubbish and falsified has found "academic momentum" in the thought expressed by Peter Singer (2018) and Bildt (2018). The reason these two scholars, in spite of their relevance to the discussion, will be sidelined for the moment is that while the scholars in question point of reference in supporting their cases was China, Popper, whose views form the focus of this study has Russia in mind. The just cited quotation from Popper which Kenny (2010) uphold commits a basic error, as it purports a kind of fundamentally wrong linkage between socialist revolution in general and communist revolution in particular. The linkage seems to postulate that socialist revolution (as it occurred in Russia) is supposed to be the same as the communist revolution that Marx anticipated. For without this assumption, there will be no reason to suppose that the nature of Russian revolution has missed what Marx anticipated, for which reason Marxism is considered falsified. The Russian revolution of 1917, although a socialist revolution, was not supposed to be thought of as a communist revolution, the former is a necessary requirement for the transition to the latter. In effect the suggestion that the Russian revolution falsifies the manner in which the expected Marxian revolution is to occur is a

mistaken analogy between two discrete events, the social revolution and the communist revolution. But one need to elaborate the justification further. Marx had mentioned that the revolution is most likely to occur in early industrialized countries like Great Britain and France. These countries were fast approaching expansion of industrialization owing to abundance of labour supply, large deposit of minerals (e.g. coal in Britain) and availability of capital for investment (Perry, Peden & Laue, 2003:129). A fourth factor is also very crucial: advancement in technology necessary for the accumulation of higher profits through the exploitation of labour. If a prediction of such state of affairs is anchored on dialectical materialism, then a falsification of the prediction also presupposes a falsification of dialectics. Marxism is a theory and hence can be misunderstood and applied wrongly. Our contention here is that the label Russian revolution is a misnomer if it is supposed to mean the same thing as Marx's ultimate projection, communist revolution. Using the Marxian frame of reference, the Russian phenomenon (the October revolution of 1917) is a socialist revolution. As such, it constitutes a specific stage of society's match towards the realization of communism itself. The character of the Russian phenomenon of 1917, therefore, does not falsify Marxian prophecies unless it is understood (wrongly) as communist revolution. However, to understand the Russian revolution as a communist one is an obvious show of the misapplication of the Marxian theory to socio-economic circumstance that does not merit such a name. The subsequent effort is to prove exactly this.

The Russian revolution began from the winter of 1916 when a steep rise in prices brought about by food shortages led to a decline in the real wages of metal-workers. Also, conditions under which Petrograd workers found themselves were extremely miserable with the said region recording the highest rate of industrial accident. Workers were forced to partake in overtime work and were often paid at standard rate. The sort of exceeding misery finds expression in the fact that January of 1917 alone witnessed thirty-four strikes in Petrograd with activists involved counting up to 24,869. On the 23rd of February 1917, multitudes of factory women filled the streets in spite of calls by labour leaders to suspend protest. 24th of February witnessed 200,000 workers of Petrograd on strike. By 25th of February, clashes between state armies and the revolutionary class were underway. On the same day, the revolutionary group created its own provisional government from members of the Duma, forcing into place dual governing power in Russia. By 3rd of March 1917, the last Tsar of Russia had abdicated and Russia was free from feudal government (Smith, 2003). The preceding narrative evidences the role of misery on the part of industrial workers as far as the revolution is concerned. In the *Communist Manifesto,* Marx demonstrates that the intensification of economic crises as technology advances, orchestrates an inevitable clash between the two classes. From this, Popper rightly identifies that the first step for the realization of Marxian revolution consists of "an increase of wealth and misery; of wealth in the ruling class (in this case, Russian feudal Lords), the bourgeoisie, and of misery in the ruled class, the workers. Popper scores this point correct. It is this increasing tension, according to Popper

(1966:344) that rest in the inevitable social revolution. In page 62 of chapter two, I argue based on the *Communist Manifesto* that Marx's envisioned communist revolution as essentially constituting a change in the ownership of property from the bourgeoisie to the working class. The establishment of skilled workers' committee following the abdication of the last Tsar (with some being members of the old administration) for managing state enterprises, even though could not last, was indicative of the birth of workers' control over production (Smith, 2003:61). But this, strictly speaking, is not the communist revolution Marx envisioned. As spelt out in the *Communist Manifesto,* preceding communism is a socialist state where the working class has wrested power and therefore would want to be at the helm of affairs. But they cannot be in power unless the remnants of bourgeoisie influence are completely exterminated by way of revolution. The remnant bourgeoisie power is however exemplified by the existence of the state whose duty it is to suppress the antagonism between the working class (now the rulers) and the disenfranchised bourgeoisie class.

The preceding relationship between Marxian prophecies and the Russian revolution communicates a profound influence of Marx's teachings on Russia. Nonetheless, when one focuses on the removal of the Tsarist regime without consideration of the fact that they were replaced by the allied forces of the bourgeoisie and the peasantry class led by the left intelligentsia, then one is seriously bound to lose sight of the whole point. To miss this point is to confuse the Russian socialist revolution (rightly called a bourgeoisie revolution) required as a transitional stage with Marx's ultimate projection, the communist revolution.

One ought to admit that Popper and Kenny might have missed this details or they might have intentionally blurred this core distinction in order to establish the prejudiced conclusion put forward. To build our argument, our point of reference is premised on Hegelian discourse**.** The metaphysical systems borrowed from Hegel by Marx included the insight that reality is an organic structure (Sheehan, 1993). For Hegel, the state is a living organism with individuals as its freed living "cells" (Lewis, 1982:68). This organic structure develops according to its specified laws, the logic of dialectics. The implication is that there is a component of Marxian philosophy devoted to the course of nature itself which consists of the self-development of the organic substance in accordance with the laws of dialectics. For Marx, since the organic substance is defined by the mode a society imbibes to produce its material needs, the natural course in this course of development is to be found in the development of productive forces up to the most advanced quantitative stage where it cannot but give way to a qualitative change in the mode of production. Marx specifically explains the nature of this growth of production capacity. In the *Capital,* Marx hinted at the following: ever-extending scale of expropriation of many proletariats by a few capitalists on a centralized basis, globalization of the world markets, dominance of monopoly capital at the global market, all of which grow simultaneously with misery of the proletariat class (1966:542). In the *Communist Manifesto*, Marx mentions the formation of giant modern industries that monopolize productivity across the globe. These industrial armies are revolutionary pillars identified by Marx as the modern bourgeoisie. Their revolutionary role consists of overthrowing the rule of

feudal lords. To be sure, 18th century Russia was generally backward as compared to Marx's own example of industrialized countries, France and England.

Feudal societies, which typified Russian economic setting before the revolutionary insurrections, existed as a middle ground between primitive and advanced economies. Feudalism has a close link with the advancement of productivity in agriculture. As an agrarian society, feudal societies owe their major economic activities to peasant farming. With this nearly stagnated mode of production, survival is anchored on the ratio of the availability of land to a given peasant family. On the one hand, as people produced more food than required to sustain the family, people were hired as soldiers to protect estates and property as the hired labour, in return, were fed with the surplus food (Ethridge & Handelman, 2010:44). On the other hand, if the family size outgrows the capacity of the land to feed them, the surplus is eaten or the family starve to death. A feudal society is therefore meant to function as maintaining appropriate balance between peasant families and the availability of the means of production (Foster, 2005:14). The described character of feudalism assumes a barrier that militates against population increment and this can only be surmounted with the growth of productive forces. In this quest, technological advancement is the most instrumental factor. It is in the development of productive forces and the propagation of the consciousness about capitalist exploitation that permit humans contribution in either speeding up or slowing down the revolutionary process. And with the invention of such large scale technological advancement with which

England had taken the lead, Marx felt it necessary to declare such areas as the precursor societies of the communist revolution. The lead taken by England in terms of technological advancement explains why its bourgeois revolution occurred earlier in the 1640s (Foster, 2005:16). It was therefore Russia's turn to take to this leap of bourgeoisie revolution, an economic transition from feudal mode of production to industrial manufacture.

It is true that Marx made a concession to the notion that the center of the revolution was shifting to the East (Hookham, 1967: 645). However, Russian feudalism erected an impassable barrier to bourgeoisie revolution. Eighty percent of the population were peasant farmers. And despite the widespread of misery and oppression, the major problem of the Russian feudal society was the neglect of the well-being of the ruled by the ruling class from cultural and economic life of the country. Members of the proletariat class were not socialist minded in the first place. As backward as Russia was, when all forms of royal despotism have ended in Western Europe, the power wielded by the Tsarist regime still remained unchallenged (Ethridge &Handelman, 2010:337). One must note that the abdication of the Tsar regime was not caused by proletariat misery. The Tsar adhered to the conviction to step-down in order to assure the participation of Russia in the war (from 1914) against Germany. This step-down by the Russian regime even surprised the likes of Lenin (Rogers, 1997: 247). Bearing in mind the Marxian call that "workers of all countries, unite" the proletariat workers, forming 2 percent of Russian population were too insignificant for the instantiation of a communist revolution. If this were not true how then would one reasonably

justify Trotsky's claim that communism (especially as it were in less advanced Russia) cannot survive unless its boarders are widened to incorporate other nations (Conforth, 1958: 75, Jackson, 1999: 846)? In fact, of the 182 million inhabitants of Russia, less than a fifth lived in towns (Smith, 2003:5). Again the fronting intellectual elites (intelligentsia) of the proletariat class were dedicated to fighting not for the improvement of the conditions that plagued their followers but for ensuring their own dominion over the ruled class and shaping the mentality of the productive class. Pipes' (1994: 222) analysis of the events leading to the Russian revolution points to the conclusion that far from oppression and misery, the major causes of the revolution were cultural and political flaws that led to the inability of the Tsars to respond effectively and efficiently in times of economic and cultural enigma. The core of Marx's teaching is that flaws are the inherent germ that work to overthrow a prevailing thesis. These flaws, however (which are rightly construed as contradictions in dialectics), are a result of workers' exploitation under the influence of competition among the bourgeoisie (Ethridge & Handelman, 2010). It suffices to conclude that the 1917 February revolution in Russia does not merit the rendition "communist revolution". Its name is clear, a bourgeoisie revolution. Therefore, the clear distinction between the bourgeoisie revolution and the (ultimate) communist revolution ought to be acknowledged in buttressing the point that the occurrence of the former does not falsify the possibility of the latter. The overthrow of exploitation was not allowed to be orchestrated by the unfolding venom of dialectical drive. Its causes were largely political flaws and not economical. In favour of the view that the February

revolution of 1917 is not the envisioned Marxian communist revolution, Smith wrote:

> The paradoxical character of the February revolution-a bourgeoisie revolution, undertaken by workers and soldiers brutally exposed the social weakness of the bourgeoisie, ones the crutch of the tsarist state had been knocked from under it. At a national level, the bourgeoisie was weak in numbers, internally divided, lacking in class consciousness, politically inexperienced and badly organized (2003:69).

What about the October revolution? It was motivated by five key factors. It sought to challenge the private ownership of property, feeling of nationalism, the veracity of religion, the institution of family, liberalism in politics and human relations which extended opportunities regarding the extermination of race, and class inequalities (Chamberlin, 1942:5). At least six classical views have been presented as theoretical perspectives on the October revolution. Of these six views put forward by Billington (1966) the heroic inevitable view and visionary-futurist view could have interpretations that could show consistencies with Marxian revolutions. However, according to the import of the former perspective, the revolution is underpinned by the political will of some privileged men of history. Whereas Marx conceives of the economic order as the force that drives politics, one finds here a different order: the priority of political heroic forces is regarded as necessary prior factors that drive a revolution. The latter perspective, of which mention is made of Kautsky as a major proponent, shares with the tragic view the idea that the path to the revolution has been foredoomed by irresistible forces. However, the visionary-futurist view further maintains that the revolution is "only

the first stage of a continuing process of social transformation that would grow ever deeper within and ever more extensive without", in his terminology, permanent revolution (Billington, 1966:465). Based on the preceding discussions, the October revolution even though a socialist revolution too, cannot also be equated with the Marxian communist revolution despite some close analogical relations between the envisioned communist revolution and the political upheavals of October. It is clear from the preceding narratives that the allusion to the October revolution as a falsification instance of Marxian prediction, most probably because Marx said the revolution is most likely to occur in industrialized countries and later in backward countries is not based on good analysis of the available literature. The following commentary from Giddens further evidences this view:

> But the October revolution took place in a country which was one of the least advanced in economic terms in Europe. It was not the clarion call for the revolutionary overthrow of Western European capitalism which Marx anticipated when, late in his career, he accepted the possibility that the communal organization of the mir could allow Russia to move directly to Socialism. Instead it was a stimulus to revolutionary change only to countries of comparable or of a lower level of economic development than Russian itself (2008:245).

The Russian economy under Stalin, embarked on collectivization of the means of production, which constitute the first and foremost important feature of the communist revolution. However, it is very clear that the upheavals that had previously occurred in February 1917 had created a gap in terms of central control

of Russia's economy. First, the Supreme Council of National Economy was set up to fill the political gap and later by the bolshevist seizure of power under the leadership of Lenin in October. Lenin himself had conceded by 1906 that the direct movement from autocracy (which governed feudal Europe) to socialism was not possible owing to the unavailability of the ripe conditions for initiating socialism (Smith, 2003: 218). It was a political crisis receding back into the February 1917 revolution for which a Marxist (Lenin) sought to experiment his knowledge of the Marxian theory, but in the absence of the necessary preliminary conditions needed to instantiate the communist revolution. The Mensheviks cried for capitalism to be allowed to fully grow before the usurpation of socialism, and hence urged workers to fight for nothing more than better working conditions, a revolution was not their expected response to the economic misery (Cornforth, 1953:75). The cause of the October revolution was purely political ineffectiveness. After the event of Bloody Sunday in Russia (1905), Lenin indicated that the proletariat class must keep their association with the Social-Democrat tight, reminding themselves of the goal of ridding mankind of exploitation (Hookham, 1967: 646). This clearly shows the intention of Lenin to experiment the philosophy of Marxism given the opportunity of the crisis thereof. It was when Lenin seized power that he began to exercise an ideological match towards a communist state (Rogers, 1992:248). It was not surprising that by 1918, Lenin had realized that the political structure was there but not the economic order (material base) needed to instantiate a revolution according to the communist project (Smith, 2003).

To push our conclusion through with further evidence, two issues are drawn from Engels' letter to Zasulich in 1885. In this letter, Engels defines the Russian revolution as one that indicates Russia's approach to 1789. But the 1789 revolution of France is however categorically described by Marx as having "abolished feudal property in favour of bourgeois property", a bourgeoisie revolution for that matter (*Communist Manifesto*). Consequently, I submit that the Russian socialist revolution was Russia's turn in the course of dialectical revolutionary stages of society, to experience its bourgeoisie revolution in the way that it happened. If this inference is plausible enough, then one would have expected, as it occurred in France, property relations to be under the control of the bourgeoisie. The very fact that workers took control of the means of production as applied to Russia's case vindicates our position that the theory of Marxism was being pushed by Lenin under prematured economic conditions and hence a direct misapplication of Marxism. Again Engels declared in the same letter:

> Supposing these people (Russians) imagine they can seize power, what does it matter? Provided they make, the hole which will shatter the dyke, the flood itself will soon rob them of their illusions... People who boasted that they had made a revolution have always seen the next day that they had no idea what they were doing, that the revolution made did not in the least resemble the one they would have liked to make (Engels, 1885).

As such, one could formalize the bourgeoisie revolution under the label "Leninism", which Thorson and Sabine (1989: 725) defined as "An adaptation of Marxism to non-industrialized economies and with a society with a prevailing peasant population". Ultimately, the quest to demonstrate the falsity of Marxian

prophecies on the anvil of the failures of Russian revolution must be declared in unequivocal terms as a misguided analogy. The Russian revolution does not falsify Marxian prophecies. They are two discrete items, the former is a necessary transitional stage required for the manifestation of the latter. Accordingly, the Russian revolution, far from serving as refuting Orthodox Marxism, makes strong the anticipation of the communist state. The specter of communism which Marx said is haunting Europe has not been falsified. Now, it is haunting the world at large.

In summary I have demonstrated that Marxian formulations consist of coherent string of claims clearly satisfying the requirement of empirical adequacy. From the first premise (i.e. the priority of serving our material needs) society is gradually led into the establishment of the communal mode of production, which is where all societies started from. The dynamism of dialectics generates the needed contradiction and society breaks apart into the exploiter and the exploited. Global economic indications point to the gradual ripening conditions needed to exterminate the contradiction. It is therefore inconsistent to regard Popper's philosophical methodology of science as an apt approach to demarcating science from pseudo-science and still deem Marxism unscientific. Marxism continues to remain what it is, an unfalsified scientific theory.

CHAPTER FIVE

MARXISM IS SCIENTIFIC.

Many attempts have been made to unseat Marxism from its celebrated essence as a scientific theory. These bourgeois scholars include Robert Tucker (1958), Kwesi Wiredu (1980), Van Den Haag (1987), Anthony Kenny (2010) among others. In *The Logic of Scientific Discovery*, the task is carried further with utmost seriousness as Popper (1962:33) compares Marxism with psycho-analysis of Freud and Adlerian individual psychology on the one hand and Einstein's theory of relativity on the other hand with the intention of demonstrating the unscientific credentials of Marxism. The study upholds the veracity of these triad: (i) Popper's falsification principle is consistent with Orthodox Marxism, (ii) Marxism is not falsified and (iii) hence auxiliary statements are uncalled for. Marxism is scientific because there is a clear-cut possible approach by which one can refute the theory. In chapter four, not only did I articulate the approach to falsifying Marxism, it was also shown that Marxism has not been falsified, at least not as far as Popper's qualms are concerned. In this concluding chapter, I conduct some brief comparative analysis involving the progress of some physical science theories and how dialectics forms the underpinning framework of scientific theorizing.

Controversy surrounding the nature of light for example, dates as far back as the fifth century when Empedocles attempted an explanation of how Aphrodite first generated light from the eye. In the 17th century, Newton and Pierre Gassendi among others favored the particle-theory of light. Newton thought

rectilinear propagation of light evidences particle-theory of light (Ramon, 2017:8). In 1905, Einstein worked out an explanation of photoelectric effect through the adaptation of quantum theory. In his explanation, he affirmed the real existence of quanta, lumps of light energy. Like Newton who had earlier discovered that gravity attracts bodies with force that is proportional to the mass of the bodies involved, Einstein believed that the lumps of light energy could be affected by gravity (Hawking, 1989:16). Because the shining power of the sun is strong enough to blur the predictive effect, it was almost impossible to observe the attraction of lights from the stars by the sun. However, nights and eclipse conditions provided a clear-cut presentation that could be photographed and was actually used to measure Einstein's predicted effect. The possibility of this state of affairs which is capable of showing Einstein's prediction to be false by way of observation, according to Popper (1962:36), marks the falsificationist basis for passing Einstein's hypothesis as scientific.

Adopting Groisman's position, one may say that dialectics prescribes a conceptual framework wherein things are understood concretely in their continuous motion and change, as conflicting elements achieve synthesis (2007:3). As opposed to the particle-theory of light, Robert Hooke and Christian Hugygens favored the wave theory of light. Waves have the propensity to undergo interference (Barnsly, 2004:6). However, particles cannot interfere with each other. When a particle meets an obstacle, it cannot bend its way around the obstacle and its specific place in space could be determined at any given time. According to the principle of identity, one derives the valid conclusion that wave

cannot be a particle. So if light is a particle, then it cannot be a wave. But wave and particles are not contradictories in the Aristotelian sense. They oppose each other in a way that they cannot both be a true description regarding the same existential element. The preceding narrative should remind readers of the conceptualization of contradiction as presented in chapter two wherein the Aristotelian concept of contradiction was rejected in favour of an understanding of contradiction more akin to the logical relation of contraries.

Now, the particle-wave duality of light endorses the view that opposing forces exist side by side in an established thesis and is a necessary component for the perfection of our grasp of reality. For example, Newton's corpuscular theory was indicative of the view that light has to travel faster in a denser medium whereas Huygens theory suggested otherwise. Maxwell Clark was greatly inspired by Faraday, and through the synthesis of electricity and magnetism, Clark theorized light as an electromagnetic wave. Consequently, the emergence of quantum theory of light gave way for the conception of light as both particle and wave (Ramon, 2017: 10). Again, Plank's mechanics was incompatible with Newtonian physics and consequently the latter was overthrown by the former. However, a synthesis of both Plank and Newton's theories was reached when Einstein demonstrated the pitfalls of both theories and substituted the said theories with a curvature of space concept of gravity (Unah, 1998).

The changing trends of reality give credence to dialectics as the appropriate underlying framework according to which the continuous perfection of scientific knowledge is realizable. Dialectics relieves objects from

metaphysical fixation for which reason objects are not understood as fully finished products. In this nature of progressive theories concerning the exact nature of light, dialectics finds exemplification. The metaphysical conceptualization of reality regards objects as isolated and fixated images (1997:67). It is given as a finished product and hence if grasped, all of its properties are fully apprehended. Dialectics, however, has none of these properties. The reason Marx calls the process dialectical is because it never achieves full realization (Russell, 1945: 784). Because its object of study is accorded the "liberty" to self-actualization, dialectics allows nature to abreast us of nature's true essence. Lewis has expressed the relationship between dialectics and science as that the former forms the conceptual framework for the workings of the latter.

> Dialectics, we must confess, is not an abstract system of logic which men are asked to accept, it is necessary because the nature of the world requires it. There are no fixed properties in the concrete world, which is why there is no fixed concepts in our science. There are no final scientific laws, therefore our thought must avoid dogmatic finality (Lewis, 1982 :9)

Popper (1962: 51) is quick and unequivocal in cautioning readers not to draw any link of identity between the dialectical process and the method he calls conjecture and refutation. Conjecture and refutation is the falsificationist required attitude in his endeavour to raise a hypothesis unto the pedestal of science. In loose and simple terms, Popper renders it as the method of trial and error. For the scientist proposes a bold conjecture (the corpus at trial) and deploys a rigorous

effort to refute it (amassing of errors). Popper thinks that to construe the corpuscular theory of light as the thesis and the wave theory of light as antithesis and the particle-wave duality as synthesis is not only careless but also a dubious application of dialectics. Popper's reason is that in the method called *Conjectures and Refutations,* it is the falsificationist (the scientist) who, by critical application of the rational faculty, generates the opposing ideas necessary for refuting the thesis. "The struggle" he says, "is one of minds; and these minds must be productive of new ideas" (1962: 315). In dialectics however, Popper says that it is the thesis itself that generates or, to state it differently, the thesis attracts its opposing necessity, antithesis. Popper is unpardonably mistaken. It is true that the thesis is responsible for generating the antithesis (McTaggart, 2000). But the nature of this fact can be misleading. First of all, the term "thesis" in Marxian dialectics is not nebulous. It stands for the designated historical epochs that marks the evolutionary stages of society, namely: slavery, communalism, feudalism, capitalism and communism. These concatenated pieces of reality, as a whole, form an evolving organic structure. The microcosm of this organic structure at any point in the developmental stages (from communalism to capitalism) consists of human persons and the way they produce their needs. Thus, the generation of the antithesis is an attribute of man's awareness of the contradiction (error) exemplified in the social nature of production and the private appropriation of surplus value. This is equally achieved through the consciousness of persons, most importantly the proletariat class who jointly constitute the productive forces of any given historical epoch, which may rightly be called thesis. The critical

application of the intellect to the realization of the antithetical element of exploitation is, to use Popper's phrase, one of minds also. For if it were not so, then it would be senseless for Marx to rally workers of all countries into a united force, as he did in the *Communist Manifesto*. The wakeup call for proletariat unity marks the stage of thinking where the proletariats are to become fully aware of exploitation and hence embark on redressing the contradiction thereof, which in Popper's scheme of reference, shall be called refutation of the thesis. Further, the role of minds is evident in Marx's submission that the very time slaves recognize their self-worth as equally humans, they cease being the property of another, and slavery reigns superficially with numbered days (Carver, 1995:173).

The last of Popper's direct charge against the scientific credentials of dialectics rests on the view that dialectical process produces knowledge by preserving only the best halves of the thesis and antithesis. This, Popper thought, is wrong since the critical scientific method of trial and error produces knowledge or ideas irreducible to thesis and antithesis alone (Popper, 1962:315). It is true that knowledge churned out of dialectics maintains elements of the thesis and antithesis for the purposes of instantiating further contradictions in the newly established thesis. Popper himself agrees with this. However, to concede this point does not imply that the resultant dialectical knowledge is limited to the preserves of the best part of the thesis and antithesis, alone. From the law of transformation of quality into quantity, one gets the impression that the resultant dialectical knowledge reserves elements which distinguish it as distinctive emergent qualitative property. Groisman says of dialectics that new content

results from dialectical development since synthesis is not limited to the construction of knowledge from the thesis and antithesis alone (2007:5). Be it as it may, I draw the final inspiration from Marx's own envisioned synthesis of which capitalism, by producing its own antithetical force (exploitation of the proletariat class) is bound to reduce to the communist state *(Communist Manifesto).* But the classless communal state wipes out the proletarian/bourgeoisie distinction, making all persons equal before property relation. However, the principle of equality before property relations, is not contained in capitalism (let alone to be considered as the best halve of it). The distinguishing feature which has been pointed out clearly indicates that dialectics can and in fact do function as a knowledge producing procedure wherein it is not necessary to maintain "best" half of preceding thesis.

Marxism differs from physical theories since the major "ingredient" that serves the basis for the theory envelopes social relations. The argument from meaningfulness employed in page 103 of chapter four is meant to emphasize this point. However, as far as falsificationism is concerned, Marxism does not differ from physical theories in terms of methodological label. This is rightly so because science based on falsificationism does not seek to distinguish between science and non-science according to exactness in prediction (Popper, 1962:36). Social relations, because of ceteris paribus clauses are less cooperative in yielding exact results in terms of predictions. But even so, Marx makes a huge progress as he is able to concretize social relations in terms of mode of production driven by the dialectical triad: "The law of the transformation of quantity into quality and vice

versa; The law of the interpenetration of opposites; The law of the negation of the negation" (Engels, 2001:18). Now, dialectics is falsified if observable social phenomenon disagrees with the mission of the laws of dialectics.

These falsifiable hypotheses which Marx pointed out have been alluded to in chapter four. It begins with Marx's first premise which holds the priority of satisfying material needs by man before thinking may be possible as expressed by Engels' speech at the graveside of Marx (Lepore, 1993). From this first premise, Marxism submits that social relations are preordained by property relations which could either be social or private in nature. From the materialist conception of history, Marx demonstrates the pattern of societies' evolution in accordance with the laws of dialectics as explained in chapter two. Communalism, which is where all societies began (from) is essentially devoid of exploitation. In analyzing the political economy, Marx characterizes subsequent mode of production (from slavery to capitalism) as historical epochs marked by private ownership of the means of production and hence exploitative. Consequently, given that a society produces for its material needs, dialectics (and by extension Marxism) is falsified if a society is able to sustain itself from breaking apart into class systems where property relations assume the core factor that instigates exploitation of the less privileged.

Popper (2002:9) holds that the scientific testing of theories could be done along four different lines. The first is the test of logical consistency of a theory. Marxism achieves internal consistency in the way it applies the laws of dialectics in explaining conclusions about social change. Second is the test of logical status

of a theory, whether it is tautological or synthetic. In this way, a good scientific system or theory ought to be synthetic, representing a possible state of affairs (as opposed to metaphysical systems), for a tautological statement cannot be falsified since it is true by definition. Because the projection of a communal state is a new evolutionary state of society not contained in the previous thesis (capitalism), the logical form of Marxian prophecy is contingent. Third is the test of scope: whether the theory constitutes advancement based on previous knowledge or not. Engels (1997: 48) believes that Marxism constitutes a major advancement in previous socialist theories as theorized by the likes of Saint-Simon, Robert Owen, and Fourier. Engels' reason was that Marxism had at heart a focus that prioritize the interest of emancipating the proletariat. Fourth is the test of empirical content: whether or not the prediction of the theory can give rise to implications that pertain to events in the empirical world.

With regards to the test of empirical content, Wiredu (1980:19) has suggested that the implications of Marxian predictions are unrealistic, and hence the communist state does not pertain to a possible state of affair. Popper's contrary view rests on his belief that the Russian revolution represents an empirical implication of Marxism. Nonetheless, Popper (1962:37) further holds that the prophetic implications of Marxism have been falsified by the character of the social revolution. In chapter four, the study proceeded to investigate the nature of the Russian revolution with the aim of inquiring whether the Russian revolution suffices to be called a falsified instance of Marxian predictions.

Contrary to Popper's view, the answer reached was that he Russian revolution rather constituted a corroborative instance of Orthodox Marxism.

As our analysis indicates, the Russian revolution rather strengthens the credibility of dialectics as the underlying framework for grasping social reality. If all stipulated preliminary conditions are met as outlined in page 132 of chapter four and the evolution of the communist thesis fails to emerge as dictated by dialectics, then dialectics is falsified and Marxism will be rendered scientifically obsolete. Because such conditions have not been satisfied, this study associates itself with Popper's stance that Marxian prophecies are falsifiable and reject his (Popper's) further claim that Marxism has actually been falsified. Accordingly, falsificationism as a philosophical methodology of science is a sufficient basis for the claim that Orthodox Marxism continues to remain what it is: an unfalsified scientific theory.

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