REVIEWING MODERN SCIENTIFIC KNOWLEDGE WITHIN THE SCOPE OF NIETZSCHE'S IRRATIONALISM

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Abstract
Human knowledge has been constrained into two major bifurcations; knowledge based on factual experience and those based on value, instincts and intuitions. Scientific knowledge is claimed to be based on empirically verifiable data; thereby being considered as the most reliable system of inquiry ever developed by human civilizations. Scientific knowledge is esteemed to be a systematic inquiry, which emphasizes the superiority of human reason over human intuitions, instincts and impulses. However, Friedrich Nietzsche expresses strong disgust for the over-glorification and exaltation of reason over those elements of human nature that serve as alternative sources of knowledge such as dark strivings, vitalism, intuitions, instincts and impulses. Nietzsche criticizes all forms of system-building as expressed in the universalization of fixed scientific methods, universal conceptions of truth and knowledge and the very idea of unquestionable religious morality and social norms. For Nietzsche, what is needed for the liberation of the human soul; and the realization of the "will to power", is the abandonment of reason and the celebration of the dark instincts, creative intuitions and animalistic outbursts, which represent the irrational part of human nature. The "will", which is a symbol of irrationality, defines human nature in its crudest form. This work proposes two major contentions: the first is that scientific knowledge is exclusive, as it denies the authenticity, validity and efficacy of other non-rational and non-systematic modes of knowing. The second contention of the paper is that there exist, non-rational, authentic, valid and efficacious elements of human nature that serve as reliable modes of apprehending knowledge, beneath and beyond rational and systematic epistemic modes, which are elaborated by Friedrich Nietzsche in his philosophical irrationalism.
Keywords: irrational, rational, science, Nietzsche, system, method, knowledge.

1. Introduction

The modern civilized man is totally overwhelmed by the dominance of rationalism. He embraces reason as the major faculty that is responsible for his choices and decisions. He is totally in praise of science and emphasizes the rational part of his nature at the expense of a part which is more indebt in his nature (i.e. the human will). Modern scientific knowledge is being projected to be based on the principles of rationality and objectivity, thereby representing the only form of reliable knowledge available to man. This is exactly the image that the scientific community likes to project of itself, which is considered by Wilhelm Newton-Smith, as that of "rationality per excellence" (Newton-Smith, 2003). p.1. According to Newton-Smith, the "scientific community sees itself as the very

paradigm of institutionalized rationality. It is taken to be in possession of something, the scientific method, which generates a 'logic of justification'" (Newton-Smith, 2003). The assumption that science represents the paradigm of institutionalized rationality, as being commonly admitted and accepted by the scientific community, implies that there is 'something special' about science, which distinguishes it from other human intellectual endeavors, such as philosophy, theology, history and the rest.

However, most members of the scientific community are of the opinion that a characteristic feature of science, which makes it 'special', is the "logic of discovery", which serves as privileged method of formulating and validating theories, involving continuous problem-solving activities. The overwhelming glorification of science over other human activities derives in large part from the successes of recent science and modern physics in particular. The exclusivity of scientific knowledge in contemporary times was triggered in large part by the emergence of logical positivism in the 20th Century, which was a movement that bifurcated knowledge into two, by introducing a criterion of significance: known as the verifiability criterion. The verifiability criterion affirms that a piece of knowledge or intellectual enterprise is only to be regarded as meaningful when it either passes the test of empirical validation or is explainable by definition (Ayer, 1959). The verifiability criterion proposes that the meaningfulness, truth and validity of a statement can only be deduced from the possibility of stating the facts that make them possible. A prominent logical positivist, Moritz Schlick, espouses this view, by stating in clear terms that: "It is the first step of any philosophizing, and the foundation of all reflection, to see that it is simply impossible to give the meaning of any statement except by describing the fact which must exist if the statement is to be true. If it does not exist then the statement is false" (Schlick, 1932), p. 88. An implication of the logical positivist's contention on the place of empirical verification for modern science is that science is an intellectual enterprise that is based on rationality and the facts of experience. Scientific claims must therefore by testable by experience.

However, Friedrich Nietzsche, being a proponent of philosophical irrationalism, discredits the scientific and positivist claim that reason and experience alone determines reliable knowledge, while affirming the irrational elements of human cognition, such as "the will", instinct, intuition, emotion, dark strivings and the rest, as bases for reliable knowledge (Nietzsche, 2010). In this paper, we attempt an exposition of the movement of irrationalism, synthesizing and contrasting it with its counterpart; rationalism. The scope of the paper is to project Nietzsche as a prominent figure in the dethronement of reason, and the embracement of the non-rational part of human nature, as the initiator of postmodernism, and as well discuss the implications of Nietzsche's irrationalism for the enterprise of modern science. This paper shall also attempt a review of the major contentions of modern science within the scope of the irrationalist pretensions of Nietzsche's philosophy.

2. The Rational Image of Science

Modern science is being widely conceived as the paradigm of rationality and the sole model of truth, which possesses the exclusive methods of arriving at reliable knowledge and problem-solving. Science is generally considered as "any "systematized", "organized" or "classified" body of knowledge which has been critically tested and is beyond reasonable doubt" (Nagel, 1961), p. 3. Therefore, for any piece of knowledge to be tagged 'scientific', it must result from a systematized, organized and classified procedure, which is guided by an underlying logic of discovery, mostly described as a method. Jack Aigbodioh identifies four characteristic features of science, which include the fact that science is said to be specific, public, impersonal and objective (1997), p. 3. The specificity of natural science is evident in the fact that science solely enquires into particular and identifiable objects which are observable in the physical world of experience, rather than merely abstract or metaphysical ideas which are beyond the realm of observable reality. Science is being considered as being able to provide us with exact explanations of the nature of phenomena around us as they actually are. The enterprise of science is regarded as being public in character, owing to the fact that the methods, techniques and procedures of science are exoteric, rather than being esoteric. This implies that scientific knowledge can be taught to the generality of persons, and can be interpersonally or inter-subjectively verifiable, rather than being known by a select few who hold an exclusive right to such knowledge. Similar to the public character of science is the claim that the enterprise of natural science is impersonal. Science is often considered as being devoid of idiosyncratic, sentimental, and imaginative beliefs or ideas, but is rather "dispassionate and unprejudiced" (Aigbodioh, 1997), p. 4. Science bases its explanations on factual judgments rather than value judgments.

The objective character of scientific claims, theories, principles and laws lies in the fact that they are all drawn from the concrete or material facts of the physical world of everyday perceptual experience. Science is said to be objective because it is entirely based on facts. The factual nature of scientific propositions is given a clearer picture by Alan Chalmers, when he writes that: "When it is claimed that science is special because it is based on the facts, the facts are presumed to be claims about the world that can be directly established by a careful, unprejudiced use of the senses. Science is to be based on what we can see, hear and touch rather than on personal opinions or speculative imaginings" (1999), p. 1. Moreover, the specific, public, impersonal and objective characters of the sciences are said to confer on them "the amazing power to uncover the truth about the world as it actually is, constituting them into knowledge par excellence" (Aigbodioh, 1997), p. 5.

However, the received view of science that scientific knowledge is derived from the facts of the physical world of perception is often attributed to two schools of thought, namely: empiricism and logical positivism (Chalmers, 1999), p. 3. The

British empiricists, notably, John Locke, George Berkeley, and David Hume share the common view that all knowledge are derived from ideas in the mind which are implanted by sensory perception. These ideas are regarded by David Hume as sense impressions which are products of perceptions of external physical objects (Hume, 1975). The external physical objects thereby serve as the facts, which every scientific theory should attempt to fit. The logical positivists, such as Alfred Jules Ayer, Carl G. Hempel, Rudolf Carnap, Moritz Schlick, and the rest, also subscribe to the empiricist view that scientific knowledge, and knowledge generally is primarily derived from the facts of experience (Ayer, 1959). The logical positivists were more interested in the form of the logical relationship between scientific knowledge and the facts. The positions of the British empiricists and the logical positivists imply that modern scientific thinking is firmly based on the principles of rationality, which include: objectivity, impersonality, precision, soundness, validity, deduction, and induction.

3. Philosophical Irrationalism

The age of Enlightenment brought with it, an appraisal of reason as the determinant factor for human personality and guide to all human endeavors. During this age, reason was regarded as sovereign. Philosophers therefore, defined human beings by their capacity to think critically. This thought system was challenged by some thinkers in the late nineteenth century. The Enlightenment conception of human rationality was questioned, while the irrational aspects of human nature were emphasized. These thinkers now saw existential elements of human life such as blind strivings, animal instincts as the primary fact of human existence. For them, reason exercised a very limited influence over human conduct and that much more than logical consciousness, all forces below the surfaces, such as: impulses, drives, instincts, feeling, and will determine human behavior (Russell, 1945). Irrationalism is a nineteenth century and early twentieth century philosophical movement which advocated the non-rational aspects of human behavior as being necessary for apprehending human life. That human life could be better explained and understood by expanding it beyond the rational to it fuller dimensions. Although, in philosophical history, irrationalists could be found before the nineteenth century, especially in the predominantly rationalistic Ancient Greek culture in the works of a poets like Pinder, dramatists, and even in such philosophers as Pythagoras, Empedocles and Plato, who all share a Dionysian (instinctive) influence (Perry, 1992).

Irrationalism is a multi-faceted reaction against the dominance of reason in philosophical history, with various strands, and orientations on the role played by reason in human behavior. Some thinkers recognize the weakness of reason, continued to value it and sought to preserve it as an essential ingredient of civilized life, while for others, the creative potential of the irrational aspect of human behavior is to be emphasized. They urged the embracing of the feelings which they considered vital to artistic creativity and a richer existence. There are still others who strongly oppose the claim of scientists and the positivists that only

mathematical truths or principles and analytical reason was the supreme arbiter of knowledge and the only part to certainty. They argued otherwise that the truths discovered by the intellect were less profound than those grasped by our interior sentiments. "Like the romantics, proponents of the non-rational placed more reliance on feeling, spontaneity, instinct, intuition, and other non-rational sources of knowledge than on reason. They belittled the intellect's attempts to comprehend reality, scorned the liberal-rational tradition, praised outbursts of the irrational, and in some instances lauded violence" (Perry, 1992). In fact, new insights were gained into the irrational side of human nature which along with the growing assault on reason influenced political life hugely. In later decades, the various currents of irrationalism mentioned above became ideologized and politicized by "unscrupulous demagogues" who sought to mobilize and manipulate the masses, with their emphasis on a chiefly Aristotelian society (Perry, 1992). A typical example of such ideological orientation was the fascist movements, which openly denigrated reason and exalted race, blood, action, and will. This runs against the position of nineteenth century liberals who held that reason had triumphed in all of human affairs.

In early modern philosophy, even when Cartesian rationalism was developing, Blaise Pascal turned from reason to an Augustinian faith, claiming that the "heart has its reasons" unknown to reason itself. Irrationalism emphasized things about the life of the spirit and human history that could not be dealt with or handled by rational methods of science (Frankfurt, 1982), p. 92. The likes of Charles Darwin and later Sigmund Freud made irrationalism a movement interested in the exploration of biological and subconscious roots of human experience. Philosophical theories and movements like pragmatism, existentialism, and vitalism (or "life philosophy") all arose as expressions of this expanded view of human life and thought (Stumpf, 2003). Arthur Schopenhauer, a typical nineteenth century irrationalist, exposited the idea of voluntarism, which expressed the essence of human life - meaning a blind purposeless will permeating all existence (Russell, 1945). Among the pragmatists, Charles Sanders Peirce and William James, the mind evolved as an instrument for practical adjustment and not as an organ for the rational plumbing of metaphysics. For them, ideas are not to be assessed in terms of logic but in terms of their practical results when put to the test of action.

Irrationalism is also expressed in the historicism and relativism of Wilhelm Dilthey, who saw all knowledge as conditioned by one's private historical perspective and who thus urged the importance of the "Geisteswussenschaften" (the humanities) (2002). Another irrationalist, Johann Georg Hamann, claims that truth could be found in feeling, faith, experience and personal conviction, above mere speculation. Friedrich Heinrich Jacobi exalted the certitude and clarity of faith to the detriment of intellectual knowledge and sensation (Perry, 1992). The likes of Friedrich Schelling and Henri Bergson who were also preoccupied with the uniqueness of human experience, relied on the idea of intuitionism, "which

sees things invisible to science." In fact, they did not attack reason itself, the belief was that it had lost its commanding role in as much as personal insights are not to be tested. Bergson's philosophy and as well as that of Nietzsche, was a form of vitalism and as well irrationalistic in holding that instinctive, or Dionysian drive lies at the heart of existence (Russell, 1945).

Friedrich Nietzsche saw moral codes as mere myths, lies and frauds created to mask forces operating beneath the surface to influence thought and behavior. Nietzsche professed that humans are free to formulate new values by claiming that God is dead (Nietzsche, 2002). Another thinker, Ludwig Klages extended life philosophy in Germany by urging that the irrational springs of human life are "natural" and should be followed in a deliberate effort to root out the adventitious reason; while Oswald Spengler extended it to history, which he viewed intuitively as an irrational process of organic growth and decay (Stumpf, 2003).

In existentialism, Soren Kierkegaard, Jean-Paul Sartre, and Albert Camus all frowned at making sense out of an incoherent world; and each chose his own alternative to reason- the leap of faith, radical freedom, and heroic revolt, respectively (Barret, 1962). Generally, irrationalism implies either that the world is devoid of rational structure, meaning, and purpose; or that reason is inherently defective and incapable of knowing the universe without distortion; or that recourse to objective standards is futile; or that in human nature itself the dominant dimensions are irrational.

4. Nietzsche and the Irrationalist Movement

Friedrich Nietzsche was the principal figure in the "dethronement of reason" and the glorification of the irrational. For him, life abounds in cruelty, injustice, uncertainty, and absurdity and this is a fact man must understand in order to enjoy full existence. Nietzsche holds firmly that life is not governed by rational principles, there is no absolute standard of good and evil, no timeless principles, whose truth can be demonstrated or proven by the activity of reflective reason. The idea of a transcendental world or what could be called the higher world of metaphysics and even the Christian heaven is for him, a myth. Nietzsche claims that nothing is true, all what is available to man is his naked self (naked man) living in a godless, chaotic, meaningless, and absurd world. This is the reality, which no one but the strong must face, for the weak have no will to face it, and thus invent fables about a higher reality and a future life, such as is provided by the Christian faith (Nietzsche, 1924).

In fact, Nietzsche claims that modern civilized, mechanized or bourgeois society was decadent and enfeebled, it is a victim of excessive development of the rational faculties at the detriment or expense of will and instinct. Against the liberal-rationalist stress on the intellect, Nietzsche urged the recognition of the dark mysterious world of instinctual desires, which for him, are the true forces behind human life. He affirms that what the modern bourgeois society has succeeded in

achieving was to smother the will with excessive intellectualizing, the result of which is the destruction of the freedom or spontaneity that sparks cultural creativity and ignites a zest for living. The critical and theoretical outlook of the modern time has for too long stifled the creative instincts that are the real forces behind human life. Therefore, for man to realize his manifold potential, he must stop relying on the intellect and begin to nurture the instinctual roots of human existence. This, he expresses as follows: "I have kept a close eye on the philosophers and read between their lines for long enough to say to myself: the greatest part of conscious thought must still be attributed to instinctive activity, and this is even the case for philosophical thought"(Nietzsche, 2002).

Traditionally, the Ancient Greek culture has been lauded for its rationality, for originating scientific and philosophical thought and for endeavoring to achieve balance, harmony, and moderation both in the arts and in ethics. This Ancient Greek culture with its overwhelming rationalistic thought system was given an unconventional interpretation by Nietzsche. Nietzsche chose to emphasize the emotional roots of Greek culture with recourse to the Ancient Dionysian spirit "that springs from the soil of myth and ritual, passion and frenzy, instinct and intuition, heroism and suffering." For him, this Dionysian spirit, rooted in the non-rational, was the source of and the force behind Greek creativity in art and drama. This is what Nietzsche means by the Greek tragedy, which declined when serenity, clarity, order, structure, form, and cold calculation – the Apollonian spirit-predominated over noble ecstasy and creative intuition. Greek tragedy, for Nietzsche was killed by rationalism which is life-undermining.

The rise of modern theoretical outlook of scientific thought which seeks to separate truth from myth, illusion, and error, Nietzsche attributes to Socrates. For him, this scientific outlook which began with Socrates and attained its height in the Hellenistic age during the time of Alexandria, had the basis and set the foundation for modern culture. Nietzsche claims that the modern westerner values the theoretical man and not the man of instinct and action! As such, they do not appreciate the creative potential and non-rational (irrational) side of human nature. Nietzsche then claims that we are beginning to recognize and discover the limitations of science and the cognitive faculty itself or rationality. Nietzsche talks about Immanuel Kant who has already giving reasons for us to doubt the capacity of the cognitive and rational apparatus to apprehend reality in itself, and then science's claim to the attainment of certainty. For Kant, the senses or the human rational and perceptual apparatus are incapable of apprehending things as they are in themselves.

5. Nietzsche as the Initiator of Post-modern Thought-system

Postmodernism represents a united force of diverse intellectual currents with a unanimous desire to undermine all categories of thought and assumptions that are typical of the historical epoch of Modernism. All attempts to seek universal standards of truth, beauty and goodness are seen as not only futile but also

restricting and tyrannizing. In place of the quest of certainty and validity common with modernism, postmodernist thinkers advocate the recognition of infinite differences and acceptance of uncertainty with regards to all knowledge. Friedrich Nietzsche is the philosopher who can be said to have ushered-in postmodernist orientation in philosophical history. Nietzsche objects to all forms of system-building, universal standards of truth and morality. According to him:

> There are still harmless self-observers who believe in the existence of "immediate certainties," such as "I think," or the "I will" that was Schopenhauer's superstition: just as if knowledge had been given an object here to seize, stark naked, as a "thing-in-itself," and no falsification took place from either the side of the object. But I will say this a hundred times: "immediate certainty," like "absolute certainty" and the "thing in itself" contains a contradictio in adjecto (contradiction in terms). For once and for all, we should free ourselves from the seduction of words!(Nietzsche, 2002).

Nietzsche criticizes Descartes' idea of the thinking self (ego) as being the basis for all human knowledge, while also repudiating the Kantian idea of the "thing in itself", which expresses some sort of objective knowledge that is to be sought after (Nietzsche, 2002). For him, there is no immediate certainty that requires only the aid of reason to be grasped (just as we have it in Descartes). Any form of system-building presupposes lack of integrity. The rejection of absolute truth, objective knowledge, universal morality, and all forms of formalisms, brings us to the concept of nihilism in Nietzsche's philosophy.

6. Nihilism and Irrationalism in Nietzsche's Philosophy: A Challenge to Modern Science

As being hinted earlier in this paper, modern scientific thinking emphasizes the rational faculty of human cognition as being essential to the production of scientific knowledge, while disregarding other elements of human cognition, such as the "will", instincts and impulses, as being unable to produce reliable and genuine knowledge. Modern science is often projected to possess a rational image, which places emphasis on a fixed, universalisable and objective method of inquiry, devoid of uncritical presuppositions which are considered as products of irrational cognitive apparatuses of man, such as the "will". However, Friedrich Nietzsche proposes an opposing view which contrasts the rational outlook of science, as being evident in his nihilistic and irrational reflections.

Nihilism is the extreme view that there is no justification for values. Nietzsche was an ardent critic of commonplace ways of thinking about truth and knowledge, for him, all thinking is perspectival, there are no facts, all what we have are mere

interpretations (Nietzsche, 2002). This explains why he was interpreted as rejecting the idea of truth and knowledge altogether, and was considered as a radical epistemological and moral nihilist. Yet, it can be said of Nietzsche, that he manifested a passionate commitment to truthfulness, and made philosophical postulations which he himself supposed to have something like knowledge as their aim. "Zarathustra" speaks thus:

> I appeal to you, my brothers, remain true to the earth, and do not believe those who speak to you of otherworldly hopes! Poisoners are they, whether they know it or not. Despisers of life are they, decaying and poisoned themselves, of whom the earth is weary: so let them pass away! Once sin against God was the greatest sin; but God died, and with him these sinners. To sin against the earth is now the most terrible sin, and to revere the entrails of the unknowable higher than the meaning of the earth!(Nietzsche, 2010), p. 13-14.

Nietzsche considers those things which are beneath the human nature, such as intuition, blind strivings, emotions, feelings, impulses, as providing the most reliable source of understanding and knowledge that is required to achieve a fuller existence. In proclaiming the death of God, he expresses the demise of universal morality, while proposing something radical, like self-acclaimed values. Nietzsche conceives human thoughts and actions as being constrained by values and at the same time clears the way for a new set of values which are constituent with human needs. Systems of values, as well as all knowledge, are for him, a set of illusions.

However, the implications of Nietzsche's irrationalist views for the enterprise of modern science is that the underlying assumptions that are often devised in support the rational image of science are mostly misguided. The assumptions often used in support of the rational image of science include the views that scientific knowledge is the only form of reliable knowledge available to man, that science is the paradigm of rationality, that science is the sole model of truth, that science is entirely based on facts, that only reason can guide man to the apprehension of reliable knowledge and a plethora of others. All these underlying assumptions of modern scientific rationality are being faulted and 'mocked' by Friedrich Nietzsche, who upholds the contention that genuine knowledge can only be derived from the more creative elements of human nature which are more indebt in man, such as the will, creative instincts, impulses, animalistic outbursts, and dark strivings (Nietzsche, 2010). As fallout of Nietzsche's irrationalist doctrines is the contention that the enterprise of science can be more comprehensive in terms of approach and method by acknowledging and adopting the irrational sources of human knowledge.

It is therefore on the basis of the above analysis of the challenge posed by Nietzsche's irrationalism to the enterprise of modern science that it is proposed in this paper that the assumption that science is based on fact and objective knowledge presupposes that the enterprise of science is methodologically handicapped, as it can only come to terms with the rational aspects of human cognition, while disregarding the efficacy of the irrational elements of man in the production of reliable knowledge. It will be of immense benefit to the enterprise of science if other non-rational sources of knowledge can be investigated and adopted veritable sources of reliable and scientific knowledge. Moreover, the very idea of fact, which science claims to explain is under contention, due to the several numerous interpretations given to the idea in different cultural and methodological contexts (Chalmers, 1999).

7. Conclusion

The basic assumptions that underlie scientific rationalism and the philosophical irrationalism of Friedrich Nietzsche have been extensively discussed in this paper, while also delving into a general analysis of the idea of philosophical irrationalism as a doctrine that upholds the irrational elements and sources of knowledge and human cognition, such as will, instincts, impulses and emotions. The scientific enterprise has been portrayed in this research work as a rational and objective enterprise, which bases its approach and methods on the principles of rationality. However, having given thorough considerations to Nietzsche's contentions about the misguided assumptions underlying the rational image of science, which include the views that science is not the paradigm of rationality, that reason alone cannot serve as the only reliable source of knowledge, and that the irrational elements of human cognition are more efficacious in the apprehension of reliable knowledge; the paper thereby submits that the enterprise of modern science can be more comprehensive in terms of approach and method by incorporating the irrational sources of knowledge in its research programs. Moreover, Friedrich Nietzsche has been discussed in this paper as being the harbinger of the post-modernist thought system, owing to his critique of all forms of system-building, universal standards and principles of rationality, and grand-theorizing.

References

Ayer, A.J. (ed.) 1959. *Logical Positivism.* (New York: Macmillan Publishing Co., Inc. The Free Press).

Barret, W. 1962. *The Irrational Man.* (New York: Doubleday Anchor Books Edition).

Chalmers, A. 1999. *What is this thing called Science?* 3rd edition. (Cambridge: Hackett Publishing Company Inc.).

Dilthey, W. 2002a. "The Delimitation of the Human Sciences". In *Selected Works.* Vol. 3, pp. 91-97. Wilhelm Dilthey, ed. Princeton: Princeton University Press.

Frankfurt, M. 1982 "Freedom of the Will and the Concept of a Person*",* in Watson, G. (ed.), *Free Will* (Oxford: O.U.P.)

Nagel, E. 1961. *The Structure of Science, Problems in the Logic of Scientific Explanation.* (New York: Harcourt, Brace & World, Inc.).

Newton-Smith, W. 2003. *The Rationality of Science.* (London: Taylor & Francis Group).

Perry, M., *An Intellectual History of Modern Europe*, Baruch College, City, University of New York: George W. Book, Editorial Associate.

Nietzsche, F. 1924. *The Antichrist.* (2nd ed.), translated by H.L. Menchen (1918). New York: Alfred A. Knopf.

_____ 2002. *Beyond Good and Evil*, Cambridge Texts in the History of Philosophy, Horstmann, R., Norman, J. ed. Trans. By Norman, J. New York: Cambridge University Press.

_____ 2010. *Thus Spoke Zarathustra*, Chapko, B. ed. Trans. By Common, T. Version 4.67.

Russell, B. 1945. *History of Western Philosophy*: United States, by American Book-Stratford press, INC., N.Y.

Schlick, M. "Positivism and Realism". In A.J. Ayer, (ed.) *Logical Positivism.* (New York: Macmillan Publishing Co., Inc. The Free Press, 1959).

Stumpf, S.E. 2003. *Socrates to Sartre and Beyond-A History of Philosophy*. New York: McGraw-Hill. 7th ed.