Logical Positivism Revisited

with special reference to the relevant writings of
Bertrand Russell, Rudolf Carnap and Alfred Jules Ayer

Ph.D. Dissertation

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ABSTRACT

Logical positivism is one of the first manifestations of analytic philosophy during the first half of the twentieth century. The early development of logical positivism aims at showing that metaphysical propositions are meaningless. The declaration of logical positivism is that a proposition has meaning only to the extent that it is verifiable. It follows from that only two classes of propositions have meanings and those are empirical and analytic. All other propositions, including those of ethics, aesthetics, and religion do not have meaning, rather they belong to 'metaphysics'. Bertrand Russell thought that it might be possible to modify narratives into their component statements, verifiable by empirical observation, reason, and logic. Rudolf Carnap is connected with the movement of the Vienna Circle. He claims that he is influenced by Russell and Frege. One of the main objections raised by critics of logical positivism is that of accusation of inconsistency; in fact, all the propositions of science are obviously not empirically verifiable. The other objection was formulated regarding the criterion of verifiability. Alfred Jules Ayer creates a distinction between strong and weak senses of verification. The objective of strong verification is to establish conclusively the truth of a proposition and that of a weak verification is to make sure that such a proposition is probably true. Wittgenstein says that the laws of logic and mathematics are tautologies, i.e. propositions devoid of factual content but true in all circumstances. However, there began a process of 'liberalization' marked by different stages, which led to formulate the criterion not in terms of 'verifiability', but in those of 'confirmability'. According to this, a proposition is meaningful if it is in 'agreement' with experience, an agreement that, far from determining final verification, leads to a growing sense of confirmation and is expressed in terms of probability. Logical positivism ended up being absorbed by analytic philosophy, which inherited both the interest in language and attention to science. Finally, despite the failure of its agenda of unification of knowledge, intellectual efforts were made to achieve the purpose, the relevant results were obtained in the field of philosophy of science and logic, as well as in the lively debate ignited in the philosophical world.

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Introduction

1.1 Introduction

Logical positivism is a philosophical attitude, which says that metaphysical statements and ideas are meaningless. It is also known as *logical empiricism*. Philosophers inclined to logical positivism opine that statements are only substantive when if it can be tested true or false by the mode of experience. Therefore, metaphysical evidence or propositions are meaningless. However, logical positivism emerges from the 'First Vienna Circle' group discussion before the first World War. A certain quantity of philosophers concentrated around Moritz Sclick (1882-1936), when he joined at the Vienna University in the year of 1922. Actually they sought to organize a study circle called *Verein Ernst Mach*, that is, Ernst Mach Society in honor of Austrian physicist Ernst Mach (1838 – 1916). This society gradually becomes popular as Vienna Circle, that is, *Wiener Kreises*, in German.

The Vienna Circle aimed at creating an integrated scientific world perspective in the name of logical positivism. The other philosophers of the circle were Hans Hahn, Victor Kraft, Otto Neurath, Olga Hahn-Neurath, Richard von Mises, Philipp Frank, Rudolf Carnap, Friedrich Waismann, Herbert Feigl, Karl Menger, Rose Rand, Kurt Gödel, and

Gustav Bergmann. In other areas of the second chapter, we would like to discuss in brief the important features of their lives and works.

Wittgenstein promulgated his *Tractatus Logico-Philosophicus* in 1921. This book laid a foundation stone for logical positivism. Most of the Vienna Circle people had an average cognition towards the basic philosophical theme drawn from this book. We find huge determinant of the thought of the then Vienna philosophers later in the research work of many philosophers, e.g., Willard Van Orman Quine (1908-2000). Schlick's Vienna Circle, along with the Berlin Circle[1] of Hans Reichenbach (1891-1953), transmits the new school of thoughts much deeply later in two decades starting from 1920. Otto Neurath's advocates for this philosophical movement and makes it broadly known. Neurath, Hahn and Carnap write the 1929 pamphlet where Vienna school of thought

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[1] In the late 1920s there was other gathering of a group of great thinkers led by Reichenbach. Hilbert, von Mises, Grelling, and Hempel were the other members that assemblage. The name of the circle is *Society for Empirical Philosophy*. Later, this circle joined with the Vienna Circle for several research works. They jointly publish the *Erkenntnis*. Both Carnap and Reichenback were the its editors. They arranged various conferences on scientific philosophy. Berlin Circle members were basically interested researching especially on the relativity theory, and interpretation of probability. After the development of Nazism, most of the Berlin Circle members leave Germany. Reichenbach first moves to Turkey and later to the United States. Hempel moves to Belgium and later to the United States. Nazis killed Grelling in one of their camps. Thus the Berlin Circle is dispersed.

is summarized at that time. This particular school of thought includes the following roughly as below:

a) The school of thought is opposed to metaphysics, particularly ontology and synthetic a priori propositions; and

b) The thought that all knowledge should be *codifiable* in a single standardized linguistic communication of science.

Ernst Mach and Ludwig Wittgenstein make the primary influences on the primordial logical positivists. Mach's influences for the logical positivists' were in the areas of metaphysics, as well as the thoughts on reductionism and phenomenalism. We have stated that Wittgenstein's *Tractatus* is a very essential textual matter for logical positivist school of thought. This book introduces many isms, primarily, the philosophical thought as a *critical appraisal of language*, and later, the prospect of representation a theoretically scrupulous distinction betwixt comprehensible and absurd discourses. For truth, philosophers later adopted the *correspondence theory* following the spirits of this great book by Wittgenstein. We see the evidence of certain conceptualization of the verification principle[2] obviously influenced by Wittgenstein. Some interpretations of probability theory of logical positivists were also influenced by Wittgenstein. If we

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[2] Verification Principle is the philosophical method, which states a proposition is substantive if and only if it can be verifiable or falsifiable.

seriously take the opinion of Neurath, we see that some among the logical positivists dislike the *Tractatus*. Neaurath says that those people think it is inundated of metaphysics.

1.2 Logical Positivism as a philosophical theory

We already know that logical positivism focused on implying strict logic and empiric observance to describe the worldly knowledge. Logical positivists projected that philosophy must not take any note of statements that were not verifiable, or, at least, confirmable by experiment. It became known as Verification Principle. It was formulated by Alfred Jules Ayer and according to him a principle has meaning if it is logically verifiable. Naturally, according to him, philosophy has no business in the discussion of morality, religious beliefs, and metaphysics, and such avenues are of no meaning because they could not be verified. Wittgenstein's another book *Philosophical Investigations* (1953) also influenced logical positivism. This immense work of Wittgenstein analyzes the impact of language upon the world. He claims that language provides limits to what people can clearly communicate and that topics such as religion, metaphysics, and morality are impossible to discuss within the restrictions of language. The *Tractatus Logico-Philosophicus* inspires the logical positivistic movement

very much in the first place. Wittgenstein, however, claimed that he was largely misunderstood and was not in agreement with the Circle on many points. Carnap employs himself to make up a meticulous logical composition for a world perspective. He tried to adopt mathematical logic to create a scientific language. Among the Vienna Circle members, Moritz Schlick is the only one who turns his focus towards the moral issues.

1.3 Logical Positivism as a concept

Here the basic issues of logical positivism will be discussed. In chapter four we shall discuss the issues elaborately. However, in empiricism, we find that all kinds of knowledge is essentially derivable from experience. David Hume says that direct and indirect – both the ideas – are copies of sense-impressions. For Wittgenstein, cognitive content could be turned into its final components, that is to say, the proximate and inconvertible centripetal observations which comprise observer's world. The structure thus bestowed is echoic in language; especially, this could be exhibited by logical investigation that the statements by which cognition is explicit are likewise reducible to basic propositions, comparable face-to-face sense experience either real or possible. Truth, in the eye of logical positivists, is either conventional or factual. We have mentioned before that propositions

have their meanings, if and only if, they can be verifiable or confirmable. Clearly, it can be said that a proposition has significance if sense perception is enough to determine its truth.[3]

It is evident that the metaphysical and theological propositions are simply not formal, unless it is argued on issues transcending average experience. Disagreement of the metaphysicians starts when they try to transcend this factual world. There is no such empirical evidence that could serve to authenticate or harm the reputation of their conclusions.

The contents of the historical propositions are known with the mediate attest for the truth. There are no way of discriminating a future observation statement from an existing one because they adopt the same verification method. Like natural laws, propositions in general are in principle not confirmable because no bounded series of observations could warrantee them to be true. For substantial objects, their verification in terms of proximate sensory observations would similarly necessitate a boundless series of so much observations to accomplished the process and decide things. Not discarding as insignificant, it was stated that these types of propositions were not actually propositions but instructions for devising observations. In other words, they were hypotheses, capable of confirming

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[3] Ibid, Page 183

or falsifying by experience, and to that extent they are valid to fulfill the purpose of science. In order to avoid these complexities, Alfred Jules Ayer proposed 'strong' and 'weak' senses of verification principle. To Ayer, a proposition is not required to be convincingly verifiable.

Logical Structure of the Scientific World (1967) of Rudolf Carnap is a highly structured effort to carry out this reformation of empirical conversation from inside the scope of a solipsism. His kind of solipsism was only methodical because the attempt is to outcome a conjectural diminution only of concepts and propositions. Here the dubiety stands as to how the information of the sciences are confirmable in respective disciplines. Advocates of logical positivism disagreed on this issue.

Otto Neurath and Rudolf Carnap did not engage themselves to handle the arguments and counter arguments of metaphysics. Their aim was to secure the objectivity of science. Science has its no interest in mental life events of the observer, and references to that are, in reality, devoid of meaning.

Rudolf Carnap engaged himself in formalizing the internal structure, that is, syntax of language. He has made threefold classification of sentences, which are shown below:

a) Syntactical sentence: They are reference to other sentences;

b) Empirical sentence: They deal with the state of affairs; and

c) Pseudo-object sentence: They appear when they can be translated into statements about words.[4]

Rudolf Carnap made these distinctions to the end that it could be argued that most metaphysical propositions of philosophy, which seem to allude to the existence of intangible entities, are actually syntactical statements about words. Philosophy then is recognized with logical syntax as an advanced level discourse of language.

1.4 Scope and Objective

In this dissertation an attempt will be made to make a critical study of the rise of logical positivism in Berlin and Vienna. This study will explain the relevant issues of the disciplines of theology and metaphysics following the views of logical positivists. It has been said earlier that the logical positivists are renowned for their verification principle of meaning. Another feature of logical positivism was the loyalty to develop a *Unified Science*, in which all scientific propositions can be expressed. This study will investigate Karl Popper's position on the criterion of falsifiability, Ayer's point on strong and weak senses of verifiability, and other

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[4] Ducasse, Curt John, (1940), Concerning the Status of So-Called 'Pseudo-Object' Sentences, *The Journal of Philosophy*, Volume 37, Number 12 (June 6, 1940), Pages 309-324, Published by: Journal of Philosophy, Inc., URL: https://www.jstor.org/stable/2018433, Accessed on 09 April 2020

subsequent objections from Quine on analytic and synthetic statements and also of Kuhn on possibility of truth conditions for science. This study will also analyze the influence of logical positivism upon later course of philosophy and its contemporary status within philosophy itself.

This dissertation mainly will concentrate on the relevant writings of three major philosophers, namely, Bertrand Russell, Rudolf Carnap and Alfred Jules Ayer. Bertrand Russell, in his life time, showed hardship in all of his analyses, receptiveness to ideas, and avoidance to dogmas. Russell conceived that it might be achievable to disintegrate narratives into their component statements, confirmable by empirical observation, reason, and logic. It has already been said that Rudolf Carnap is associated with summarizing the doctrines of the Vienna Circle. The story is like this: in 1921, Carnap writes a letter to Bertrand Russell because he could not manage to get a copy of *Principia Mathematica* (1910, 1912, 1913). Russell responded by copying passages fully by hand from his significant work. Carnap attends seminars led by phenomenologist Edmund Husserl (1859-1938) in 1924 and 1925. He then continues writing on physics adopting logical positivist world-view. Carnap and Reichenbach meet with each other at a conference in 1923. Reichenbach introduces Carnap to Professor Schlick. He offers Carnap a teaching position at the Vienna

University. Carnap joined there in 1926. He therewith used to attend an informal group meetings of Viennese intellectuals. This informal group later became the Vienna Circle. Carnap wrote two important books: one, *The Logical Structure of the World* (1928) in there he formulated a stringent accepted interpretation of empiricism; and the other, *Pseudoproblems in Philosophy* (1928) where he describes that numerous philosophical inquiries are meaningless, that is, the way they are questioned, amount to an ill-usage of language. An implication of this revolutionary attitude is the elimination of metaphysics. This is very important perspective for which Carnap is well remembered for many years. Logical positivism movement is led by the Vienna Circle, a group of philosophers. Two names are important here: Carnap and Schlick. They continued with the empiricist knowledge domain philosophy – a thinking process after David Hume before and subsequently pursued by Russell and Wittgenstein. Ayer formalize this way of thinking this to the Anglo-American world by his work *Language, Truth and Logic* (1935).

Chapter Two

Study Circles

In this chapter, we shall discuss two important study circles, namely, Berlin Circle and Vienna Circle. The philosophers connected with these circles made the history and put stones together to build the theory of Logical Positivism. In the late 1920s, Hans Reichenbach, Kurt Grelling, and Walter Dubislav laid the foundation stone of the Berlin Circle. On the other hand, led by Moritz Schlick, some philosophers and scientists used to meet on regular basis from 1924 to 1936 at the Vienna University. These people later formed the *Vienna Circle of Logical Empiricism*. We shall try in this chapter to state the general ideas of the members of the circles.

2.1 Berlin Circle

Reichenbach, Grelling, and Dubislav created this intellectual group named *The Society for Empirical Philosophy*. Philosophers like Hempel, Hilbert, and von Mises were the members of this Circle. They used to publish a journal named *Erkenntnis*, in English, 'Knowledge'. We know that the editors of this journal are Rudolf Carnap and Hans Reichenbach. This proves that this Berlin Circle had a better understanding of the Vienna Circle. Later we shall see that both the groups together organize couple of congresses on philosophy of science. In Prague, their first congress is held in 1929.[5] The Berlin Circle used to discuss things mostly common with the Vienna Circle and their views were almost similar except the topics of probability and traditionalism. Reichenbach was inflexible to call his philosophy *logical empiricism* to differentiate that from *logical positivism*. Berlin Circle members were operational in analyzing the philosophical consequences of the advances in modern-day physics, especially the relativity theory. Besides that, they contravene the soundness of metaphysics and conventional philosophy.

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[5] Murzi, Maruo, Internet Encyclopedia of Philosophy (https://www.iep.utm.edu/berlincr/), Accessed on 09 April 2020

The Berlin and the Vienna Circles both fought against two trends: philosophical traditionalism and philosophical impracticality. The Vienna Circle are known for a simplified version of language that brought an intellectual revolution with 20th century Western philosophy. In their attempy, the Berlin Circle was a close partner with the Vienna Circle.[6]

When an extreme form of nationalism, that is, Nazism, developed in Germany, some members of the Berlin Circle left Germany. They went to different countries. In 1933, Reichenbach first moves to Turkey and later in 1938 to the United States. Walter Dubislav moves in 1936. Hempel first in 1934 went to Belgium and later in 1939 to the United States. In a concentration camp of Poland Grelling was killed in September 1942. Olaf Helmar left Germany and worked in the RAND Corporation from 1946 to 1968. He died in 2011. Due to the deficiency of the Berlin Circle members, the group eventually broke but their intellectual method left a footprint and influenced a wide range of thinkers, especially philosophers doing analytic philosophy.

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[6] Milkov, Nikolay (2013), The Berlin Group and the Vienna Circle: Affinities and Divergences. In: Milkov N., Peckhaus, V. (Eds.), The Berlin Group and the Philosophy of Logical Empiricism, *Boston Studies in the Philosophy and History of Science*, Volume 273, Springer, Dordrecht

2.2 Vienna Circle

Vienna Circle story is a bit long and it develops through various stages. Hans Hann, Philipp Frank, and Otto Neurath used to sit together from 1908 and they talked about the philosophy of science and epistemology. Mathematician Hann was the oldest among them. Neurath studied mathematics, political economy, and history. Philipp Frank had his background in physics from Göttingen and Vienna. He also held the chair of theoretical physics at the German University in Prague. From 1907, they used to meet and discuss among themselves in Viennese coffee houses. Frank says:

> After 1910 there began in Vienna a movement which regarded Mach's positivist philosophy of science as having great importance for general intellectual life […]. An attempt was made by a group of young men to retain the most essential points of Mach's positivism, especially his stand against the misuse of metaphysics in science. […] To this group belonged the mathematician H. Hahn, the political economist Otto Neurath, and the author of this book [i.e. Frank], at the time an instructor in theoretical physics in Vienna. [...] We tried to supplement Mach's ideas by those of the French philosophy of science of Henri Poincaré and Pierre Duhem, and also

to link up them with the investigations in logic of such authors as Couturat, Schröder, and Hilbert.[7]

Writings of the other philosophers like Brentano, Meinong, Helmholtz, Herts, Husserl, Freud, Russell, and Whitehead were discussed in those meetings. Frank goes to Prague to take the position of theoretical physics in 1912 and then the meetings adjourned. The position is much honored because Einstein held the chair before him. Hahn left Vienna during the first world war. The activities of Vienna Circle start again in 1921 when Hahn returns to Vienna. In the first place they arranged two seminars; one is on Wittgenstein's *Tractatus* and the other one is on Whitehead and Russell's *Principia Mathematica*. Mathematician Kurt Reidemeister (1893-1971) co-hosted them and arranged these seminars. In 1922, the Vienna University appoints Moritz Schlick to the chair of philosophy. The full name of this chair is *Philosophy of the Inductive Sciences.* Before him, it was held by Ernst Mach. Schlick already had his two important publications in the years of 1917 and 1918 on the issues of general theory of knowledge, space and time, and contemporary physics. Schlick arrives in Vienna and organizes some discussions with the mathematicians of the

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[7] Uebel, Thomas (2003), "On the Austrian Roots of Logical Empiricism" in *Logical Empiricism – Historical and Contemporary Perspectives*, eds. Paolo Parrini, Wesley C. Salmon, and Merrilee H. Salmon, Pittsburgh : University of Pittsburgh Press, 2003, Page 70

University. Most of the discussing members were close to Hahn. Friedrich Waismann and Herbert Feigl, two famous students of Moritz Schlick requested him for a regular study circle in the evening. Schlick invites them at the Institute of Mathematics for the discussion. Stadler (2001) says that these evening meetings were the beginning of the Vienna Circle.[8] The group that used to meet from 1924 on was very different and not only that among them were recognized scientists like Moritz Schlick, Hans Hahn, Victor Kraft, Philipp Frank, Heinrich Gomperz, Otto Neurath, and Olga Hahn-Neurath, but there were younger research students and doctoral candidates.[9] Carnap comes to the Vienna University in 1926 to take the position of a lecturer. At that time His *Logical Structure of the World* was being profoundly talked about in the Circle at that time. *Tractatus* was also widely read and discussed. Wittgenstein, Schlick, Waismann, Carnap and Feigl used to sit amongst them personally from 1927.[10] Ernst Mach Society was formed in 1928 and Schlick chaired it. The main focus of the society was to disseminate a scientific world-view. Vienna circle people did their

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[8] Stadler, Friedrich (2001), *The Vienna Circle. Studies in the Origins, Development, and Influence of Logical Empiricism.* New York: Springer, Page 199, 2nd Edition: Dordrecht: Springer, 2015

[9] Ibid, Pages 199-218

[10] For the record of meeting, please see, Brian McGuinness (1979), *Wittgenstein and the Vienna Circle: Conversations Recorded by Friedrich Waismann.* Trans. by Joachim Schulte and Brian McGuinness. New York: Barnes & Noble Books

best to spread this specific scientific world conception in the public spheres.[11]

Otto Neurath crafted the name of the circle and he uncovered this name when they published its Manifesto, *The Scientific Conception of the World* in 1929. At that time the circle is best famed as *Viewing the World Scientifically: The Vienna Circle*. Neurath and Carnap jointly signed in the preface of the event brochure. This was dedicated to Schlick and Hahn. A conference on *Epistemology of the Exact Sciences* was arranged. The Manifesto was presented at that conference and that was jointly organized by the Vienna and Berlin circles. We know that the said conference is the first global public event of logical empiricism. Their other notable conferences were held in the cities and venues like in the years of 1930: Königsberg of present Russia (the then Prussia); 1934: Prague; 1935: Paris; 1936: Copenhagen; 1938: Cambridge, United Kingdom; 1939: Cambridge: Massachusetts; and in 1941: Chicago. In Königsberg conference, Gödel announces that he has tested the completeness of first-order logic also the incompleteness of formal arithmetic. Dedicating quantum physics and causality, in 1936, there was another fascinating conference held in Copenhagen.

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[11] Stadler, Friedrich (2001), Pages 342-44

The state of matter of the Vienna Circle was unequivocally political and they were famous for their views on the natural sciences and metaphysics. Neurath and Schlick, both were socialists. They conceived that negation of magic was an essential factor for freedom of the working classes. This manifesto connected Friedrich Engels and Karl Marx and also to their political standpoints. Both the circles take responsibility to publish the *Annalen der Philosophie.* Under the editorship of Carnap and Reichenbach, they make it their official journal under the title *Erkenntnis.* Also, they publish a number of monograph series on the scientific world conception and the unified science.

Feigl leaves Austria in the beginning of 1930s for political reason. We already know that Carnap took a position at Prague University in 1931 but in 1935 he leaves for Chicago. In 1934, Hans Hahn dies due to a critical surgery operation. Neurath fled to Holland due to the triumph of fascism in the civil war in Austria. *Ernst Mach Society* is dissolved for all of these political reasons. Hans Nelböck, a former student of Vienna University killed Schlick in 1936. The killing puts a full stop of assemblage of the Schlick Circle.[12] Other members of the circle like Kraft, Waismann, and

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[12] For documents concerning the killing of Professor Moritz Schlick and the trial against Nelböck, please see Stadler (2001), Pages 869–909

Menger used to meet continually. Acquisition of Austria to Nazi Germany in 1938 puts a distinct endpoint of the Vienna Circle activities.[13]

For the researchers there was a good news. This is that in 1991 in Vienna, a society was established. Again, Institute Vienna Circle (IVC) was formed to do research and study the impact of the Vienna Circle. It is considered as a centre of the Philosophy and Education faculty of Vienna University in 2011.[14] In 2015, this institute organized an exposition on the Vienna Circle in the main edifice of Vienna University.[15] Since 2016, in intimate cooperation with the IVC, the former society advances its activities under the new name Vienna Circle Society (VCS).[16]

2.3 The 1929 Manifesto

We are already up on that the Manifesto of the Vienna Circle is revealed in 1929. In Manifesto, they advocate a scientific world-view, defined by the generalization that there is no deserted knowledge. They chant like slogan that such scientific position towards the world is to be implemented and

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[13] In 1949, there arose the *Kraft Circle* in Vienna, a successor to the Vienna Circle, under the leadership of Viktor Kraft. We know that he is a former member of the Vienna Circle. The other member of this circle was Paul Feyerabend (1924 – 1994).

[14] *Institute of Vienna Circle*, University of Vienna, Accessed 09 April 2020

[15] Sigmund, Karl (2017), *Exact Thinking in Demented Times: The Vienna Circle and the Epic Quest for the Foundations of Science*, New York: Basic Books, xxviii + 480 pages, Accessed 09 April 2020

[16] *Vienna Circle Society*, Accessed 09 April 2020

disseminated for all the people, in view to modify learning systems for quality of life.

The Manifesto is defined fundamentally by two characters. First, it bears an empiricist characters. It also advocates that the source of knowledge is only experience. The second chracteristic, viz., their world-view is noted by the method of application of logical interpretation.[17] Logical interpretation is the methodical system of analysis of philosophical problems what makes an extended exercise of symbolic logic. It also differentiates the empiricism of Vienna movement from its earlier interpretations. Logical analysis describes about two separate types of statements. One type is reducible to simpler statements and the other type of statement that cannot be turned into statements about cognitive content. The second type includes all metaphysical statements and in turn they are meaningless. Therefore too many philosophical issues are disapproved as pseudo-problems because they originate from logical mistakes.

One of the sources of the logical mistakes is ambiguity; the ambiguity of natural language. Vienna Circle rejects synthetic a priori knowledge. They

[17] Sarkar, Sahorta (1996), *The Scientific Conception of the World*, *The Emergence of Logical Empiricism: From 1900 to the Vienna Circle*, New York: Garland Publishing, Page 331

accepts exclusively two types of statements: 1) synthetic *a posteriori*, that is, scientific statements; and 2) analytic *a priori*, that is, statements.

The conflict betwixt scientific world-view and metaphysics is not a mere conflict between separate types of philosophies, but it is also a conflict between several political and social attitudes. Scholars of the Vienna Circle perceive this as an underlying acknowledgment to a dividing line between the two political groups of the Vienna Circle. Neurath and Carnap principally represent a particular wing. Moritz Schlick led the other. The aim of the wing led by Carnap and Neurath was to assist the incursion of the scientific world-view in the realms of private and public life, also in defining their social and economic life.[18] On the other, Schlick was in the first place concerned in theoretical research of philosophy and science.

As listed in Manifesto, we find the names of Dubislav, Frank, Grelling, Ramsey, Reichenbach, Reidemeister, and some other important philosophers like Einstein, Russell, and Wittgenstein. Some of them are mentioned sympathetic and are others are ascribed as representatives.

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[18] Ibid, Pages 339-40

2.4 General Idea of the Vienna Circle members

There is evidence that all the Schlick Circle members could not get the membership of Vienna Circle. The circle characterized two types of their members, such as inner circle members and periphery members. Some people attended regularly in all of the circle activities. They are inner circle members. The short names of these members are Bergmann, Carnap, Feigl, Frank, Gödel, Hahn, Olga Hahn, Juhos, Kaufmann, Kraft, Menger, von Mises, Neurath, Rand, Schächter, Schlick, Waismann, and Zilsel. The periphery members are mentioned as occasional visitors, foreign visitors and leading intellectual figures, who maintained regular contact with the Circle. They are Alfred Jules Ayer, Egon Brunswik, Karl Bühler, Josef Frank, Else Frenkel-Brunswik, Heinrich Gomperz, Carl Gustav Hempel, Eino Kaila, Hans Kelsen, Charles W. Morris, Arne Naess, Karl Raimund Popper, Willard Van Orman Quine, Frank P. Ramsey, Hans Reichenbach, Kurt Reidemeister, Alfred Tarski, Olga Taussky-Todd, and Ludwig Wittgenstein. [19]

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[19] Stadler (2001), Page 573

2.5 Dissemination of Logical Positivism in the US and the UK

The dissemination of logical positivism in the Anglo-American world happened in the decades of 1920s and 1930s. Schlick was a visiting professor at Stanford in 1929 and in 1932. Feigl went to Iowa in 1930, joined as a lecturer in 1931 and became professor in 1933 at the Iowa University. The explicit dissemination of logical positivism in America was due to Carnap, Feigl, Frank, Hempel, and Reichenbach. They went to and taught their in America. Willard Van Orman Quine is another link to the United States. He is an American philosopher and as a Sheldon Traveling Fellow he traveled to Vienna, Prague, and Warsaw in 1932 and 1933. Another American philosopher Charles W. Morris assisted many of the circle members to go to America. We know that Carnap is one of them. It is Ayer who made familiar the British world with the Vienna Circle activity through his book *Language, Truth, and Logic* (1936). British philosopher Karl Raimund Popper never went in the circle meetings but he is also essential for the critique of their work.

We find plurality in philosophical stance amongst Vienna Circle people. Members used to change their opinions essentially in course of time and in

response to discussions held in the Circle.[20] There are works edited and published in two major collections by Vienna Circle. They published their first collection titled *Monographs on the Scientific World-Conception*, edited by Schlick and Frank. The books are listed as follows:

1. von Mises, Richard (1928), *Probability, Statistics, and Truth*, New York: Macmillan company, 1939

2. Carnap, Rudolf (1929), *Demolition of the logistics*

3. Schlick, Moritz (1930), *Problems of Ethics*, New York: Prentice-Hall, 1939

4. Neurath, Otto (1931), *Empirical Sociology*

5. Frank, Philipp (1932), *The Law of Causality and its Limits*, Dordrecth; Boston: Kluwer, 1997

6. Kant, Otto (1932), *On the Biology of Ethics*

7. Carnap, Rudolf (1934), *The Logical Syntax of Language*, New York: Humanities, 1937

8. Popper, Karl Raimund (1934), *The Logic of Scientific Discovery*, 1934, New York: Basic Books, 1959

9. Schächter, Josef (1935), *Prolegomena to a Critical Grammar*, Dordrecth; Boston: D. Reidel Pub. Co., 1973

10. Kraft, Victor (1937), *Foundations for a Scientific Analysis of Value*, Dordrecth; Boston: D. Reidel Pub. Co., 1981)

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[20] Uebel, Thomas (2014), Vienna Circle, *The Stanford Encyclopedia of Philosophy*, Spring 2014 Edition, Edward N. Zalta (ed.), URL: http://plato.stanford.edu/archives/spr2014/entries/vienna-circle/, Accessed on 09 April 2020

From 1938, *Unified Science (Einheitswissenschaft)*, Carnap, Frank, Hahn, Neurath, Joergensen (after Hahn's death), Morris edited the second collection. Hence the books are:

1. Hahn, Hans (1933), *Logic, Mathematics and Recognition of Nature*

2. Neurath, Otto (1933), *Unified Science and Psychology*

3. Carnap, Rudolf (1934), *The Task of Science-Logic*

4. Frank, Philipp (1935), *The End of Mechanistic Physics*

5. Neurath, Otto (1935), *What does Rational Economic Analysis Mean?*

6. Neurath, Otto, E. Brunswik, C. Hull, G. Mannoury, J. Woodger (1938), *On the Encyclopedia of the Unity of Science*

7. von Mises, Richard (1939), *Ernst Mach and the Empirical View of Science*

These works are translated in *Unified Science: The Vienna Circle Monograph Series Originally Edited by Otto Neurath*, Kluwer, 1987. Monographs published in the *International Encyclopedia of Unified Science*:

1. Otto Neurath, Niels Bohr, John Dewey, Bertrand Russell, Rudolf Carnap, Charles Morris (1938), *Encyclopedia and unified science*, vol.1, no.1

2. Charles Morris (1938), *Foundations of the theory of signs*, vol.1, no.2

3. Victor Lenzen (1938), *Procedures of empirical sciences*, vol.1, no.5

4. Rudolf Carnap (1939), *Foundations of logic and mathematics*, vol.1, no.3

5. Leonard Bloomfield (1939), *Linguistic aspects of science*, vol.1, no.4

6. Ernest Nagel (1939), *Principles of the theory of probability*, vol.1, no.6

7. John Dewey (1939), *Theory of valuation*, vol.2, no.4

8. Giorgio de Santillana and Edgar Zilsel (1941), *The development of rationalism and empiricism*, vol.2, no.8

9. Otto Neurath (1944), *Foundations of social sciences*, vol.2, no.1

10. Joseph H. Woodger (1949), *The technique of theory construction*, vol.2, no.5

11. Philipp Frank (1946), *Foundations of physics*, vol.1, no.7

12. Erwin Finlay-Freundlich (1951), *Cosmology*, vol.1, no.8

13. Joergen Joergensen (1951), *The development of logical empiricism*, vol.2, no.9

14. Egon Brunswik (1952), *The conceptual framework of psychology*, vol.1, no.10

15. Carl Hempel (1952), *Fundamentals of concept formation in empirical science*, vol.2, no.7

16.   Felix Mainx (1955), *Foundations of biology*, vol.1, no.9

17.   Abraham Edel (1961), *Science and the structure of ethics*, vol.2, no.3

18.   Thomas S. Kuhn (1962), *The structure of scientific revolutions*, vol.2, no.2

19.   Gerhard Tintner (1968), *Methodology of mathematical economics and econometrics*, vol.2, no.6

20.   Herbert Feigl and Charles Morris (1969), *Bibliography and index*, vol.2, no.10

Chapter Three

Bertrand Russell's analysis on Logical Positivism

Russell thought about the possibility of decomposing description into their element

statements. To him, these are verifiable by empirical observations, and reason. In this

chapter we shall discuss his position on logical positivism

3.1 Russell's logical atomism

Logical atomism is an early thought of Ludwig Wittgenstein and Bertrand Russell. The theory tells that we can analyze all propositions into simple elements of meaning related to elements making up facts just about the world. In 1911, Russell named this theory in his work in French language titled '*Le Réalisme analytique'*, later translated into English and published in his collected papers.[21] Since his early writing is in French, thus Russell gives some lectures on logical atomism. We know that these lectures were later published in *The Monist* in 1818 and 1919.[22] Russell says that the world contains *facts,* these facts are analyzable structures, and these structures consist of particular objects. The reality is, an object has a quality or it maintains some relations to other objects. Furthermore, there lies judgments or beliefs, which are in a relation to the facts. When we follow Russell, we see that words like 'this' and 'that' are used to indicate particulars. We know that the logical atomism theory of Russell consists of three inter-linking parts and they are: a) the atomic proposition; b) the atomic fact; and c) the atomic complex.

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[21] Russell, Bertrand; Slater, John Greer; and Frohmann, Bernd (1992), *Logical and Philosophical Papers*, 1909-13, Psychology Press, ISBN 9780415084468

[22] *The Monist*, Volumes 28 & 29

We conceive atomic proposition as the primary judgment. It is a primal statement, which describes an individual entity. Russell calls this specific entity as his atomic fact. He acknowledges variety of elements inside each fact that he referred to as either particulars or universals. A particular indicates a signifier such as a name and many of which may apply to a single atomic fact. On the contrary, universal imparts quality to these particulars, such that, color, shape, and disposition. Russell in his theory of acquaintance mentioned that sense data brings awareness of these particulars. Each system consists of numerous atomic propositions. Russell says that their similar atomic facts are famed conjointly as an atomic complex. He further says that the complexes are illustrious as molecular facts in that they have multiple atoms. To him, this atomic complex is a ware of human thinking and also thinking process that combines the respective atomic facts in a logical manner. In his theory of acquaintance, we see that in a positive statement, say for example, 'the milk is white', one must be acquainted with the atomic fact that the milk is white. We know that this statement matches with exactly this one fact. In the same manner, the negative statement like, 'the milk is not white', is totally false because we know about the color of the milk and that this similar fact must prevail. Irrespective of whether the later statement is true or not true,

Russell says that the link betwixt its proposition and a fact must itself be true. The important belief of logical atomism is famed as the 'logically perfect language principle'. This principle opens up that everything prevails as atomic proposition and fact and that all language signifies reality. Russell opines that this necessitates negative facts. On the contrary, Wittgenstein advocated for formal Principle of Bivalence.[23] In this, we find that the states 'P' and 'Not (P)' cannot exist together.

3.2 Russell's view on logical positivism

Tractatus is first published in Deutsch in 1921 and later translated and published in English by C. K. Ogden with the help of Frank Plumpton Ramsey in the next year. We also know that it was re-translated later by D. F. Pears and B. F. McGuiness and it appeared in 1961. Russell writes an introduction to the book claiming in the beginning:

> 'whether or not it proves to give ultimate truth on the matters with which it deals, certainly it deserves, by its breadth and scope and profundity, to be considered an important event in the philosophical world'.[24]

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[23] Cf., Goble, Lou (2001), *The Blackwell Guide to Philosophical logic*, New Jersey: Wiley-Blackwell, Page 309

[24] 'Introduction by Bertrand Russell' to Wittgenstein's *Tractatus Logico-Philosophicus*, London: Kegan Paul, 1922

It is very interesting to say that at first Wittgenstein thought very well of Russell's introduction, but later he claims that it was full of misunderstandings. According to Ayer, the *Tractatus* of Wittgenstein leaves a profound influence on the Vienna Circle.[25] Carnap, however, feels that Wittgenstein's determinant on the Vienna Circle is often exaggerated. Carnap claims that Schlick and Waismann were influenced by Wittgenstein but not Neurath and himself.[26] He says that he was more influenced by Russell and Frege.[27]

We have seen that the analytic philosophy passed through many internal struggles that dissonance its history into several phases. The first time period is defined by *quasi-Platonic* platform of realism advanced and endorsed by G.E. Moore and Bertrand Russell according to which, roughly speaking, realism is a disjunctive to idealism. We know that their realism is expressed in the idiom of *propositions* and *meanings*. Consequently, it is understood to pertain a turn towards analysis of language. Moore and Russell, both abandoned their this kind of understanding of realism by 1910. Moore, however, continued with his realistic philosophy of *common*

[25] Ayer, A.J., et al. (eds.), (1963), "Vienna Circle", *The Revolutions of Philosophy*, London : Macmillan, Page 70

[26] Alston, W. P. and George Nakhnikian (eds.), (1963), *Readings in Twentieth Century Philosophy*, New York : Free Press of Glencoe, Page 384

[27] Srinivas, Kunchapudi (2011), *Logical Positivism Revisited*, Delhi : D.K. Printworld (P) Ltd., Page 55

sense. Bertrand Russell moved along with the way and developed his own theory of logical atomism with Wittgenstein. This modification to logical atomism and to *ideal-language analysis* identifies analytic philosophy of another state and the time-period for this course is 1910-1930. The later phase, the age of which is roughly 1930-1945, is defined by the growth of logical positivism, formulated by the Vienna Circle members and popularized by Alfred Jules Ayer.

3.3 Russell's influence on logical positivism

In the Anglo-American world, Russell had a leading influence on modern philosophies. His influence was dominant on Ludwig Wittgenstein, when he was his student between 1911 – 1914.[28] The influence of Russell on Wittgenstein we can see throughout the *Tractatus*. Russell assisted securing Wittgenstein's PhD and a teaching position at Cambridge.[29] Russell, however, happens to differ with linguistic and analytic formulation of Wittgenstein to philosophy dismissing it as *trivial*. On the other hand, Wittgenstein considered Russell as a *superficial glib* for his popular writings. He said, oddly enough and sarcastically, that the books of Bertrand Russell are to be bound in two covers, those handling the

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[28] *The Autobiography of Bertrand Russell, the Early Years*, Page 202

[29] *The Autobiography of Bertrand Russell*, Pages 435-440

mathematical philosophy in blue, every students of philosophy must read them. The other books, handling with popular subjects, should be bound in red, no one should be allowed to read these books. We know that the influence of Bertrand Russell is also apparent in the works of Ayer, Carnap, Popper, Quine and a definite quantity of other philosophers and logicians.

Chapter Four

Contribution of Rudolf Carnap in the Early Development of the Vienna Circle Philosophy

Here we shall talk about the story of Carnap's writing the Vienna Circle Manifesto and his struggle in building the background philosophy of Logical Positivism to the Elimination of Metaphysics.

4.1 Introduction

We are already aware that German-American philosopher Rudolf Carnap (1891-1970) is a major member of Vienna Circle. Also he is one of the three persons who wrote the *Manifesto* of a philosophical movement later called Logical Positivism. In his *Pseudoproblems in Philosophy* (1928) Carnap stated that many philosophical questions were meaningless. An operational entailment of this radical attitude was taken as a criterion towards the elimination of metaphysics. Logical positivism is a philosophical world-view of the 1920's and 1930's disseminated by the Vienna Circle. A group of philosophers, especially Carnap and Schlick pursued this empiricist scientific philosophy in the tradition of Hume and early work of Ludwig Wittgenstein. This movement entered into the English knowledge world mostly through the *Language, Truth and Logic* (1936) of Alfred Jules Ayer.

4.2 Vienna Circle Manifesto

In the preceding section 2.3 we have discussed that the Vienna Circle Manifesto was published in 1929 with the title *Scientific Conception of the World: The Vienna Circle*.[30] Vienna Circle ideas are portrayed in the

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[30] Hahn, Neurath and Carnap 1929 [1973], *Wissenschaftliche Weltauffassung: der Wiener Kreis (Scientific Conception of the World: The Vienna Circle)*; Henceforth, Manifesto

Manifesto and it is stated that there is a scientific attitude distinguished by generalization that there is no deserted knowledge, and no insolvable perplexity, as can be traced in metaphysical discussions. This specific posture towards the globe should be disseminated to the sphere of knowledge of all people in order to improve quality of life in general, since it supports the human capability of problem resolution with no recourse to any kind of supernatural thought but at the same time proposing that we are to reliably encounter the problems that the planetary seems to present to us.[31]

In the Manifesto we find that it besides talks about the knowledge produced by scientific world-view. The turning factor of this group is that they agree with such a body of knowledge by using the tools of symbolic logic, which permit one to realize the links among scientific concepts. This part of the proposal was constructed primarily by Carnap by means of the building of a logical system of rules in which all things are to be accompanying to objects from the elementary cognitive content of the individual.[32] Subsequently, Carnap leaves behind the necessity of reference

[31] Ibid, Pages 304-10

[32] Da Cunha, Ivan Ferreira (2013), 'The Utopia of Unified Science: The Political Struggle of Otto Neurath and the Vienna Circle', *Principia*, published by NEL – Epistemology and Logic Research Group, Federal University of Santa Catarina, Brazil, Volume 17, Number 2, Pages 319-329

to the primary experience of subject taking physical objects as the fundamental ones in his system. This form of transformation, already reasoned in the *Aufbau* [Construction], was stated as well in *The Unity of Science* (Carnap, 1932a). Carnap projected a sentence structure that constructs all statements of science identifying them from those of metaphysics.

4.3 Vienna Circle and Rudolf Carnap

Carnap went to the universities of Jena and Freiburg to study philosophy, physics and mathematics. He also studied Kant under the supervision of Bruno Bauch, a neo-Kantian philosopher of Germany. Thus he became interested in Kant's theory of space and this later helped him much to write his PhD dissertation on physical theory of space.[33] He got involved with the Vienna Circle when he met Hans Reichenbach in 1923 at a philosophy conference in Erlangen and through Reichenbach he got closer with Moritz Schlick and by the year 1925 he moved to Vienna University as an assistant professor. Soon he became a prime member of the Vienna

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[33] Carnap, (1922), *Der Raum: Ein Beitrag zur Wissenschaftslehre* [Space: A Contribution to the Theory of Science], *Kant-Studien*, Ergänzungshefte, number 56. His PhD thesis.

Circle along with Hans Hahn and Otto Neurath. In one of his personal letters Carnap wrote:

> Until 1926 I worked completely on my own small village in Germany. I started out on my philosophical road, strongly influenced by Russell and Frege (my teacher). My aim was the application of modern logic for the analysis of scientific concepts and the clarification of philosophical problems. I was not at all thinking of a philosophical movement.[34]

In this context the opinion of Srinivas seems relevant. Srinivas says: '… though Carnap claims that he was more influenced by Russell and Frege, there were many who said that the Vienna Circle received all inspiration from Wittgenstein (1889-1951)'.[35] A. J. Ayer maintains that the *Tractatus Logico-Philosophicus* of Wittgenstein had an intense influence on the Vienna Circle.[36] But, Alston says:

> Carnap was not in complete agreement with this statement. He feels that Wittgenstein's influence on the Vienna Circle is often exaggerated. To a greater extent, claims Carnap, Schlick and

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[34] Cf. Alston, W.P. and George Nakhnikian (1963), Eds., *Readings in Twentieth Century Philosophy*, London: Collier-Macmillan Limited, Page 384

[35] Srinivas, Kunchapudi (2011), *Logical Positivism Revisited*, New Delhi: D.K. Printworld (P) Ltd., Page 55

[36] Ayer, A. J. (1963), "Vienna Circle", *The Revolution in Philosophy*, London: Macmillan, Page 70

Waismann were influenced by Wittgenstein but not Neurath and himself.[37]

Srinivas further says:

On the one side Schlick and on the other side Carnap established themselves as two protagonists of the Circle. The group led by Schlick was known as "right wing" because of their moderate views on various issues; while the other group led by Carnap was known as "left wing" for their radical approach towards various issues.[38]

The Vienna Circle lost its initial spirit and started disintegrating by 1936. Hans Hahn, a very important figure of the Circle died in 1934. On June 22 of 1936, Moritz Schlick was assassinated by one of his students. Owing to this tragic absence of these two outstanding thinkers, the Circle was gradually leading towards a sad end and after few years was eventually dissolved. Besides that, the Nazi aggression on the Jewish community caused fear among some of the members. Some of them left the country and Carnap himself fled to the United States.

4.4 Rejection of Metaphysics

Carnap opined that metaphysics aims at making statements regarding certain things that do not fall within nor do they fit into his avowed

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[37] Ibid, Alston and Nakhnikian, 1963, Page 384

[38] Ibid, Srinivas (2011), Page 54

principle. Expressing of one's feeling about certain things may be otherwise important, but metaphysics, if this is to be a genuine branch of philosophy, is not meant for that; theology or religion could be an alternative ventilation. The manifesto contends that such kind of tasks are to be carried through art, and not by conjectures that intend to be knowledge.[39] Later, after three years or so, Carnap said that metaphysicians are musicians with no musical quality – since they cannot handgrip any musical device rather they bend into pseudo-theoretical research.[40]

The most important priority of logical positivists is to eliminate metaphysics from philosophy. Actually this attempt is not new to the history of philosophy. Before them, Hume showed disinterest in metaphysics. For Auguste Comte metaphysics was more concerned about impersonal and abstract forces and in that way this is dogmatic. Immanuel Kant revealed that at least certain type of metaphysics is impossible as the human understanding cannot reach the so claimed domain of metaphysics, i.e., thing-in-itself. Srinivas' statements seem quite relevant here too. He says that logical positivists classified substantive statements into two

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[39] Hahn, Neurath and Carnap, (1929) [1973], Page 307

[40] Carnap (1932b), Pages 73-80

kinds: a) analytic statements of logic and mathematics, which do not require any confirmation from sense-experience for their certainty; and b) synthetic statements of natural sciences, whose truth or falsehood is dependent on sense-experience. All those statements which do not fall under either of these two categories are metaphysical and consequently meaningless. In this way, they claim that they have been able to demolish metaphysics completely.[41]

4.5 Carnap and the Verification Principle

Logical positivists introduced the *verification principle* as a reference point of meaning by the use of which all the statements of science would be tested satisfactory and metaphysical statements by contrast would be censured as meaningless. All analytic statements are exempted from this principle of verification since they are non-empirical. The positions of the members of the Circle, however, differ as to their formulation of the principle of verification. Schlick claimed conclusive verification, whereas Ayer and others suggested two forms of verifiability: strong and weak, as it would be impossible to verify a statement conclusively. Carnap suggested confirmability in the place of verifiability. On the other hand,

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[41] Srinivas (2011), Page 58

Schlick was interested in semantic analysis whereas Carnap had shown some negative attitude towards semantics and instead concentrated on syntax.

The most notable view of logical empiricist trend is the *verifiability principle* and Carnap urges that this requires a logical conceptualization of the method. In *The Logical Structure of the World* (1928), he says that a statement is substantive only if every non-logical term is expressly definable by means of a very classified phenomenalistic language. Sooner, Carnap accomplished that this thesis was anemic because a phenomenalistic language is deficient to stipulate physical concepts. Then he projected an objective language i.e., *thing language* as the fundamental language, one in which every early term is a physical term. All other position of terminology – biological, psychological, cultural – must be defined by means of basic terms. To get over the difficulty that an explicit definition is often infeasible, Carnap used dispositional concepts, which can be initiated by means of reduction sentences.

4.6 Reduction Sentence

Carnap amended the verifiability principle in his book *Testability and Meaning* (1936) in his own way. He depicts: *all terms must be reducible,*

by means of definitions or reduction sentences, to the observational language. But this seems to be insufficient. Popper shows that not only some metaphysical terms can be turned into the observational language and in this way they fulfill his requirements but there are cases where some genuine physical concepts fail to satisfy this criterion. Carnap acknowledged the soundness of this critical appraisal and in his *The Methodological Character of Theoretical Concepts* (1956) wanted to acquire a new definition. The important philosophical properties of Carnap's new principle[42] can be defined under cardinal headings mentioned below:

1. The importance of a term becomes a relative concept: a term is substantive with respect to a given theory and a given language. The meaning of a concept thus depends on the conception in which that thought is used. This represents a significant adjustment in the conventional empiricist theory of meaning.

2. Carnap expressly acknowledges that several theoretical terms cannot be reduced to the observational language: they adopt an empirical meaning by means of the links with other reducible theoretical terms.

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[42] Carnap, Rudolf (1956), The methodological character of theoretical concepts, *Minnesota studies in the philosophy of science*, Volume 1 (1956), Pages 38-76, Minneapolis: University of Minnesota Press, Accessed on 09 April 2020 from the University of Minnesota Digital Conservancy, http://hdl.handle.net/11299/184284

3. Carnap realizes that the rule of operationalism is overly restrictive.

The 1946 Nobel winner Percy Williams Bridgman formulates the theory of operationalism in *The Logic of Modern Physics* (1927). To Bridgman, every physical concept is featured by the operations a physicist uses to utilize to it. Bridgman contends that the derivatives of space-time, a concept used by Einstein in his general theory of relativity, is insignificant, because it is not definable by means of operations.[43] Bridgman afterwards denatured this philosophical point of view and acknowledged that there was an indirect link with observations. Perhaps influenced by Popper's criticism, or by the problematic consequences of a strict operationalism, Carnap also changed his primary point of view and openly acknowledged that there exists an indirect relation betwixt theoretical terms and observational language.[44]

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[43] Bridgman, Percy Williams (1927), *The Logic of Modern Physics*, New York: MacMillan

[44] Carnap, Rudolf (1936), Testability and Meaning, *Philosophy of Science*, Volume 3, Number 4, October 1936, Pages 419-471 Published by: The University of Chicago Press on behalf of the Philosophy of Science Association, URL: https://www.jstor.org/stable/184400, Accessed on 09 April 2020

Chapter Five

Logical Positivism

5.1 Theories of Logical Positivism

In the preceding section 1.3, we have got a primary idea about logical positivism. In this chapter, we shall in detail talk about the theory of logical positivism; especially we shall focus more on the topics discussed in the introductory chapter of this dissertation in the first place. The issues like Verification Principle, Falsification and other related things will also be discussed here. We already know that logical positivism is a philosophical world-view began in Vienna and was defined by the analysis that scientific cognition is the single type of *de facto* knowledge and that all conventional metaphysical principles are to be discarded as without meaning. This philosophical theory disagrees the earlier forms of empiricism – those of David Hume and Ernst Mach – in embracing that the eventual foundation of knowledge gives sole emphasis upon individual experience or understanding. It also disagrees with the thinking process of August Comte and John Stuart Mill in keeping that metaphysical principles are not false but also have no meaning. According to logical positivism, all authentic philosophy is depicted as a critique of language, and its consequence is to show the unity of science – that every authentic knowledge about nature can be expressed in a single language universal to all sciences. We have already known that the Vienna Circle had brought

forth its Manifesto in 1929 and before that the persons behind the Manifesto had necessary discussions among the leading physicists and mathematicians of that time. We have also noted that a general decision was drawn that the empiricist attitude of Mill and Mach was deficient, because it failed to explicate mathematical and logical truths. Moreover, it could not satisfactorily explain the *a priori* component in natural science. Ludwig Wittgenstein's *Logisch-philosophische Abhandlung*[45] was published in 1921 and Hans Hahn brought it before the students of the University of Vienna in 1922. We are aware that this immense work initiated a new general theory of meaning and provided the Vienna Circle its logical foundation. We have already seen that almost all of the circle members immigrated to the United States during the nationalist rise in Germany before and after the beginning of World War II. But meanwhile, their students and followers had grown up in many other countries. In England, Alfred Jules Ayer produced an excellent philosophical work and we all are aware of this book *Language, Truth, and Logic* (1936) with an important entry to the opinions of the Circle in its 1946 edition.

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[45] Wittgenstein, Ludwig (1921), "Logisch-Philosophische Abhandlung", *Annalen der Nat. u. K. Philosophie* 14, Pages 185-262, Translated by C. Ogden *Tractatus Logico-Philosophicus*, London, 1922, Revised edition 1933, Reprinted, London: Routledge Kegan Paul, 1983

5.2 Verifiability Criterion of Meaning

The verifiability criterion of meaning is a philosophical set of guidelines. It has other names like verificationism or the verification principle. It says that which statements through empirical observation are verifiable, or verifiable through senses, are cognitively meaningful. Naturally, by this guideline, statements precise to the other fields like metaphysics, theology, ethics, and aesthetics are rejected as cognitively meaningless. Furthermore, it is stated that much these statements may be substantive, in manipulating emotions or behavior, but not in the form of transforming truth value, message or *de facto* content.[46] This verification principle is a central thesis of logical positivism, which wanted to unify scientific and philosophical issues under a joint realistic theory of knowledge. Vienna Circle philosophers shortly understand that the criterion of verifiability is too rigid. As a consequence, all universal generalizations become through empirical observation unverifiable. In other words, under the theory of verification, many propositions of science and reason, including scientific hypotheses, would be turned into meaningless propositions.[47]

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[46] 'Verifiability principle", *Encyclopædia Britannica*, Accessed on 09 April 2020

[47] Sahotra Sarkar and Jessica Pfeifer, Eds. (2006), *The Philosophy of Science: An Encyclopedia*, Volume 1: A–M, New York: Routledge, 2006, "Rudolf Carnap", Page 83

Friedrich Waismann and Moritz Schlick stuck to a 'conservative wing', which kept up a strict principle of verification. On the other hand, philosophers like Carnap, Neurath, Hahn, and Frank guided a group who tried to form the verifiability standard much inclusive. They start moving towards *liberalization of empiricism*. Schlick wanted to transformed universal generalizations into structure of *rules* where from verifiable statements can be reached.[48]

Rudolf Carnap, in 1936, wanted to switch from verification to *confirmation*.[49] The confirmability criterion of Carnap, that is, confirmationism does not need a conclusive verification. He did this to accommodate universal generalizations. At last we notice Carnap to give his consent to a biased testability to establish his point, *degrees of confirmation*, on a probabilistic basis. We saw that he did not succeed in formulation of his hypothesis notwithstanding engaging plentiful logical instruments for his purpose. In all of Carnap's formulations, a universal law's *degree of confirmation* is zero.[50] His *degrees of confirmation* tool brings to our memory that he might had been influenced by Ramsey but

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[48] Schlick, Moritz (1931), "Die Kausalität in der gegenwärtigen Physik" (The causality in current physics), *Die Naturwissen-schaften* (*Natural Sciences*), Volume 19, Pages 145–162; Translated as "Causality in Contemporary Physics" in Schlick (1979b), Pages 176–209

[49] Sahotra Sarkar and Jessica Pfeifer, Eds. (2006), Page 83

[50] Murzi, Maruo, "Rudolf Carnap (1891–1970)", *Internet Encyclopedia of Philosophy*, Accessed on 09 April 2020

nowhere in his writings had he admitted this. We see that a decade before this proposal of Carnap in 1926 Ramsey begins a journey towards giving a powerful relationship of the norms of partial belief. Ramsey's essay is a great piece of work on *subjectivist* interpretation of the theory of probability. According to subjectivistic interpretation, probabilities can be understood as numerical representations of the personal *degrees of confidence*, such that two individuals could opt different probabilities to the same proposition even given the same situation. Ramsey's *Truth and Probability*[51] is written in 1926 and published in 1931, a year after Ramsey's death. The article is not very widely discussed. However, we see that in 1936 Ayer produced his *Language, Truth, and Logic* and he revised it in 1946. There he projected two forms of verification: *strong* and *weak*. This system adopts decisive verification but it also kept room for accommodation of probabilistic statements. Ayer distinguishes betwixt theoretical and practical verifiability. Under theoretical verifiabilty, propositions that cannot be substantiated in activity would still be meaningful if they can be substantiated in principle. In next chapter we shall discuss more about Ayer's contribution to logical positivism.

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[51] Ramsey, F.P. (1926), "Truth and Probability", in [FM], Pages 156–198; also reprinted in *Studies in Subjective Probability*, H. E. Kyburg, Jr. and H. E. Smokler (Eds.), 2nd Edition, New York: R. E. Krieger Publishing Company, 1980, Pages 23–52

5.3 Falsification

Karl Popper advances the falsifiability principle in *The Logic of Scientific Discovery* (1934). He adopts falsification as the standard where scientific hypothesis could be acceptable. The theory of *falsification* allows hypotheses explicit as universal generalizations, such as *all crows are black*, to be tentatively true until falsified by evidence, in contrast to the verification theory under which they would be disqualified immediately as meaningless. Popper designates falsification theory as a methodological standard specific to the sciences instead as a theory of meaning.[52] He regards scientific hypotheses to be subjective, as well as not *confirmable* under Carnap's thesis.[53] He finds that some non-scientific and metaphysical statements often are affluent in meaning and import than some in the domain of scientific theories.[54]

Popper is identified basically with his philosophical position and that is *critical rationalism*. In relation to the scientific method, the term *critical rationalism* points towards his rejection of classical empiricism. Popper argues that scientific theories are abstract in nature, and can be tested only

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[52] Popper, Karl Raimund (1963), Chapter 4, Sub chapter "Science: Conjectures and refutations", in Andrew Bailey, Edited, *First Philosophy: Fundamental Problems and Readings in Philosophy*, 2nd Edition (Peterborough Ontario: Broadview Press, 2011), Pages 338–42

[53] Ibid, Pages 338-42

[54] Hacohen, Malachi Haim (2000), *Karl Popper: The Formative Years, 1902–1945: Politics and Philosophy in Interwar Vienna*, Cambridge: Cambridge University Press, Pages 212–13

indirectly, by reference to their implications. To him, no definite quantity of positive outcomes at the level of empirical testing can confirm a scientific theory, but a single refutation is logically very influential. It displays the theory from which the deduction is derived, to be false. For example, a given statement of a law of some scientific theory – better we call it *T* – is falsifiable does not actually mean that *T* is false. To a certain extent, it does really mean, if *T* is false, then *T* could be shown to be false in principle by experiment. The explanation of Karl Popper as to the logical imbalance between verifiability and falsifiability lies at the centre of his philosophy of science. He took falsifiability as his standard of boundary between what is, and what is not, really scientific. He says that a theory is to be well thought out scientific, if it is falsifiable. He uses this specific tool to show inadequacy of the arguments of psychoanalysis and the then Marxism towards their claim that they have scientific position, on the ground that their theories, are not falsifiable.

Popper in his book *All Life is Problem Solving* (1999) wanted explicating the perceptible advancement of scientific cognition, that is, how it is that our apprehension of the cosmos seems to ameliorate over time.[55] This

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[55] Popper, K. R. (1999), *All Life is Problem Solving*, Translated by Patrick Camiller, Reprinted, London: Psychology Press

problem emerges from his point that the truth content of our theories, even the champion of them, cannot be verified by scientific testing, but can solely be falsified. In this discourse the term *falsified* does not mention to something being *fake*; to a certain extent but that anything can be displayed to be false by observance or experiment. Some things plainly do not bestow themselves to being shown to be false, and consequently, are not falsifiable.

For the question of induction, Popper says that although here is no way to demonstrate that the sun will rise tomorrow, this is, however, affirmable to theorize the conception that every single day the sun will rise; if it does not rise on some specific or exceptional day, the concept will be falsified and will have to be altered by a contrary one. Until that day, it is not necessary to evaluate the premiss that the concept is true. Popper says that it is not rational to make instead the more knotty premiss that the sun will rise until a given day, but will stop rising the day after, or analogous statements with extra conditions. Popper holds that logicality is not restricted to the area of empirical theories, but that it is just a specific case of the general know-how of criticism, the know-how of uncovering and eliminating contradictions in knowledge sans ad-hoc measures. To this view, rational

discourse about metaphysical concepts, about judgmental values and even about purposes is possible.

Falsifiability principle attempts into *prima facie* difficulties when the epistemic status of mathematics is considered. It is ambitious to conceptualize how statements of arithmetic, say for example '2 + 2 = 4', can ever be shown to be false. If they are not wide-open to falsification, they cannot be scientific. If they are not scientific, it inevitably to be explicated how they can be clarifying real world objects and events. Popper's solution[56] is an original endeavor in the philosophy of mathematics. His idea is that a number statement, such as, *2 mangoes plus 2 mangoes, equal to 4 mangoes* can be interpreted in two senses. First, it is irrefutable and logically true, and in the second, it is factually true and falsifiable. Briefly, the pure mathematics *2 + 2 = 4* is forever true, but, when the instruction is applied to real-world mangoes, it is wide-open to falsification.[57]

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[56] Gregory, Frank Hutson (1996), *Arithmetic and Reality: A Development of Popper's Ideas*, City University of Hong Kong, Working Paper Number WP96/01, Republished in *Philosophy of Mathematics Education Journal*, Number 26 (December 2011)

[57] Ibid, Gregory, Frank Hutson (1996)

Chapter Six

Alfred Jules Ayer's Contribution to Logical Positivism: with Special Reference to his Vindication of the Verification Principle in his book *Language, Truth and Logic*

In this chapter, we shall discuss Ayer's contribution to the logical positivism focusing on his book Language, Truth and Logic. Ayer is the philosopher who popularizes the theory of logical positivism to the Anglo-American audience.

6.1 Introduction

British philosopher Alfred Jules Ayer (1910 – 1989) is famous for his notable ideas like verification principle and emotivist ethics. Besides he is famed for the endorsement of logical positivism, especially in his books *Language, Truth and Logic* (1936) and *The Problem of Knowledge* (1956). Ayer advanced the principle of verification as the only ground for philosophy in his book *Language, Truth and Logic*. To him, unless an empirical or a logical verification is affirmable, the statements as *God exists* or *charity is good* are not true or untrue but insignificant, and therefore be ignored. Ayer later reiterates that he does not believe in God.[58] Ayer visits the Vienna Circle at his young age and starts working on his book at the age of twenty three. We repeatedly have said that he brought few Vienna Circle ideas to the Anglo-American world through his book *Language, Truth and Logic*. In this chapter, I shall shortly discuss Ayer's contribution to logical positivism and how he described various types of verification. I also shall briefly discuss how he attacked metaphysics referring to his book published in 1936.

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[58] "I do not believe in God. It seems to me that theists of all kinds have very largely failed to make their concept of a deity intelligible; and to the extent that they have made it intelligible, they have given us reason to think that anything answers to it." Ayer, A.J. (1966), 'What I Believe', *Humanist*, Volume 81, Number 8, August, Page 226

In 1929 Ayer got a scholarship to study at Christ Church of the Oxford. There he read philosophy and Greek language, where Ayer met Gilbert Ryle. His teacher Ryle asked him to study *Tractatus*.[59] Ryle also influenced him to visit Vienna to study with Schlick and that made him to pick the basic perceptions of logical positivism. To Ayer the main role of philosophy is the logical analysis of language. He believed that the content of philosophy is language and its apparent method is analysis. In fact, logical positivists have their two cardinal features: a) promoting the reasoning concerning science and mathematics; and b) ousting metaphysics from the sphere of philosophy. So, the logical positivists gave attention to logical, epistemological and semantic issues. Srinivas says that logical positivism is another form of empiricism. The adherents themselves claim that certain basic features of logical positivism resemble Humean empiricism. However, the only difference, according to logical positivists, lies in their emphasis on a powerful logical technique.[60]

6.2 Purposes of Logical Positivism

The most priority issue for the logical positivists was to get rid of metaphysics from the domain of philosophy. This attempt is not new to the

[59]   Wittgenstein, Ludwig (1921), *Tractatus Logico-Philosophicus*, Original English translation by Frank P. Ramsey and C. K. Ogden in 1922, New York: Harcourt, Brace and Company, Inc.

[60] Srinivas, K. (2011), Logical Positivism Revisited, Delhi: D.K. Printworld (P) Ltd., Page 57

history of philosophy. We have noted that before them, Hume also showed his aversion for metaphysics. August Comte felt that metaphysics was more concerned with impersonal and abstract forces of the phenomena and that in these it was dogmatic. Kant revealed that certain type of metaphysics is impossible as the human understanding cannot reach the domains of metaphysics, e.g., thing-in-itself. Following Humean argument, logical positivists classified substantive statements into two kinds: a) analytic statements of logic and mathematics, which do not need any confirmation from sense-experience for their certainty; and b) synthetic statements of natural sciences, whose truth or falsehood is dependent on sense-experience. All those statements which do not fall under either of these two categories are metaphysical and consequently meaningless. In order to call the statements of metaphysics as meaningless, they introduced 'principle of verification' as a reference point of meaning. All the analytic statements are exempted from this principle of verification since they are non-empirical.

The Vienna Circle members differed in their formulations of theories, e.g., principle of verification, probability etc. Moritz Schlick demanded conclusive verification, while Ayer later on suggested that verifiability be taken both in its strong and weak senses, since it is impossible to verify

many statements even of science conclusively. Carnap advocated for confirmability in place of verifiability. But no matter what the differences they have regarding their approaches, their main concerns were the same; they regarded language as the only issue of philosophy and that its method is analysis. It is very complicated to draw one complete picture of logical positivism because diverse opinions were offered by different philosophers of the Vienna Circle on various issues and aspects. Our main aim here is to provide an analysis of A. J. Ayer's statements concerning logical positivism and his version of the principle of verification.

6.3 Ayer on Philosophical Analysis

Analysis is a process in which composites are divided into a variety of units or samples. This process is seen normally in science. For example, physicists analyze matter into atoms and these atoms are further analyzed into sub-atomic particles like electron, proton, neutron, neutrino, anti-neutrino etc. This sort of analysis is basically practiced in science in order to know the inner structure of various elements. But what kinds of analysis does a philosopher perform? Ayer is of opinion that there are no elements in philosophy to conduct experiment on them. Further, it is not the duty of a philosopher to identify the behavior of natural phenomena. Ayer made it

quite distinct that the discourse of philosophical analysis is concerned with the function of language. This analysis consists in rewriting sentences of the language we use in our every day discourses as well as in sciences in such a way that these sentences exhibit their proper logical form. When they are put into their proper logical forms, their meanings become clear and thus philosophical confusions are cleared also. By this approach, upholds Ayer, the traditional problems of philosophy are found to disappear.

Ayer thought that the introduction of logical analysis as a method of philosophy would prevent philosophers from indulging in the affairs of science as well as metaphysics. Logical positivists attempted to draw a logical difference between those statements that are 'verifiable' and thus 'meaningful' and those statements that are 'not verifiable', and therefore are 'meaningless'. All those verifiable statements are supposed to have scientific character and all those unverifiable ones are supposed to have metaphysical nature.

6.4 Elimination of Metaphysics

Logical positivists wanted to obviate metaphysical issues from the sphere of philosophy but it was not an easy task. Before them, David Hume

through, metaphorically speaking, all metaphysics to fire for it can have nothing but *illusion and sophistry*. In his *Critique of Pure Reason*, Immanuel Kant attempted to show that 'metaphysics' of a certain sort is impossible.[61] August Comte (1798 – 1857) attempted to show that metaphysics is one of the stages of man's intellectual development. Comte claims to have rejected metaphysics as a phase on the way to positive cognition and positive stage is the stage on the way from where the world has outgrown. Comte tried to say that positive stage is the culmination of the evolution of human cognitive content, which had passed from the *theological stage* through the *metaphysical stage* and had eventually reached the *positive stage*. To Comte, metaphysics deals with the 'essences and causes' of the universe. In fact, logical positivist conception of natural sciences is of the same kind as that of Hume and Comte. But Ayer says that there is no other way for a metaphysician except an empirical verification to infer anything about the nature of the reality. He attacked metaphysicians on logical grounds. This is where Ayer and other logical positivists claim to add logical rigor to the traditional empiricism of Hume. Ayer puts forward a criterion which would enable him to

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[61] Kant, Immanuel (1781), *Critique of Pure Reason*, Translated by Norman Kemp Smith, London: Macmillan, 1973, Page 21

understand the nature of meaningful statements, and thus enable him to distinguish meaningful propositions from the meaningless assertions of metaphysics. Ayer introduces the *principle of verification* as a reference of meaning. He also classifies important propositions into analytic and synthetic.

Ayer states that analytical statements are tautologies. A tautology is a statement, which is inevitably true by explanation, and true under all situations. Using different words or symbols, a tautology is a continuance of the significance of a statement. Ayer considered statements of logic and mathematics as tautologies. These are true by explanation, and thus their credibility is independent of empirical tests. Empirical propositions or synthetic statements, affirm or negate propositions about the actual world. The credibility of a synthetic statement is not accepted just by the explanation of the symbols or words it has been there. In his view, if a statement explicits a proposition of the empirical world, and so the credibility of the proposition in question is implanted by its empirical verifiability. Propositions are statements that have conditions below which they can be brought for verification. By this verifiability principle, it is indicated that substantive statements have stipulations below which their credibility can be affirmed or negated. The statements, which are not

substantive cannot be expressed in the form of propositions. In this way, it s seen that verifiable propositions are substantive, though they may either be true or false. Each proposition affirms or negates something, and thus either is true or false.

6.5 The Principle of Verification

As noted above, Ayer put forward the principle of verification in command to distinguish betwixt substantive propositions, and those which are absent of exact significance. In his famous book the revised expression of the principle, which can be stated as:

> We say that a sentence is factually significant to any given person, if and only if, he knows how to verify the proposition it purports to express – that is, he knows what observations would lead him, under certain conditions, to accept the proposition as being true or reject it as being false.[62]

Ayer differentiates betwixt propositions, that are in principle verifiable, and those, that can be verified in practice. A proposition only can be substantiated in activity if one is in an appropriate place to verify it. But this seems to obviate many substantive statements. Then Ayer initiates the concept of being verifiable in principle. Ayer also puts two opinions in

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[62] Ayer, A.J. (1936), *Language, Truth and Logic*, London: Victor Gollancz Ltd., 2nd Edition, 1946, Page 16

verifying the propositions. He says that propositions can be either strongly or weakly verified. Strong verification is possible only *if, its truth can be conclusively verified in experience*.[63] The set of propositions, in this case, which can be strongly verified is comparatively small. For instance, general propositions such as 'tobaco is poisonous' cannot be once and for all verifiable, since such general propositions are configured to cover a boundless number of situations. This seems to drive us away to a point where strongly verifiable propositions are those that are accompanying our undeviating phenomenal experience. It likewise rules out the propositions about the distant past that cannot ever appear to be strongly verified.

Propositions could be weakly verified *if it is possible for experience to render it possible*.[64] The idea of weak verification permits a large amount of propositions to be figuratively significant. We may now perceive that the proposition 'tobaco is poisonous' can be verified as experience can lead us to cogitate that it is extremely probable. It also allows us to accept propositions about the distant past as substantive if it could be shown that it was likely for them to have occurred.

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[63] Ibid, Page 18

[64] Ibid, Page 18

Ayer offers another conceptualization of the verification principle in his *Language, Truth and Logic* which disaccords from the preceding formulation. In this version, a proposition that consists of an existent or affirmable observation is well thought out as an *experiential proposition*. This formulation seems to inscribe our concerns about propositions which are not affirmable to be verified now. Further, there are propositions the meanings of which are relevant to having their mention to different meaningful propositions. A proposition such as *salt is soluble* can be numbered as an *experiential proposition* because in collaboration with other different propositions, it allows us to infer other *experiential propositions*.

Chapter Seven

Concluding Remarks

In this final chapter, we shall try to stay on our position that intellectual migration hampers the unified knowledge building process. Knowledge now has no boundary but we also see that the killing of great persons still put a full stop in knowledge building process in this particular specialized area. This happened with Socrates, Giordano Bruno, Hypatia, and Moritz Schlick.

In what follows, we shall see that there are different opinions regarding logical positivism – both positive and negative. There is a saying that the logical positivism is a dead issue now for philosophical analysis. John Passmore (1967) is the main spokesman of this kind of view. He says:

> Logical Positivism, then, is dead, or as dead as a philosophical movement ever become. But it has left a legacy behind. In German speaking countries, indeed, it wholly failed; German philosophy as exhibited in the work of Heidegger and his disciples represents everything to which the positivists were most bitterly opposed. In the United States, Great Britain, Australia, and the Scandinavian countries, and other countries where empiricism is widespread, it is often hard to distinguish the direct influence of the positivists from the influence of such allied philosophers as Russell, the Polish logicians, and the British 'analysts.' But insofar as it is widely agreed that transcendental metaphysics, if not meaningless, is at least otiose, that philosophers ought to set an example of precision and clarity, that philosophy should make use of technical devices, deriving from logic, in order to solve problems relating to the philosophy of science, that philosophy is not about the 'world' but about the language which men speak about the world, we can detect in contemporary philosophy, at least, the persistence of the spirit that inspired the Vienna Circle.[65]

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[65] Passmore, John Arthur (1993), 'Logical Positivism', in *The Encyclopedia of Philosophy*, edited by Edwards, Vol.5, Page 56, Cf. Alvin C. Platinga, 'A Christian Life Partly Lived,' Chapter 3, in *Philosophers Who Believe: The Spiritual Journeys of 11 Leading Thinkers*, edited by James Kelly Clark, Downers Grove, IL: InterVarsity, 1993, Pages 62-63

Popper is famous, for saying, 'I killed logical positivism', through his criterion of falsifiability. The above two represent the negative view on logical positivism. On the other, there is a positive view as well Harold H Titus (1964) in his book includes a chapter on logical positivism. For this philosophical issue Titus says:

> '… the proper task of philosophy to be the analysis of language, especially the language of science. The approach represents a definite shift from the methods and tactics of traditional philosophy. Instead of attacking the arguments per se of the traditional philosophers, the members of this school have turned to a criticism of language in an attempt to show that the older issues are meaningless as presented.'[66]

Titus was an American thinker; born in 1896 and died in 1984. His philosophical views are not unknown to us. But being born in Australia, John Passmore (1914 – 2004) was more of a historian of ideas than a philosopher. He concentrated his focus mainly around philosophical issues

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[66] Titus, Harold H. (1964), *Living Issues in Philosophy*, Woodstock: American Book Company, Pages 279-80

like remembering,[67] David Hume's intentions,[68] philosophical reasoning,[69] perfectibility,[70] our responsibility of nature,[71] recent philosophies,[72] and aesthetics.[73] We see him dealing with major common issues of present day philosophies. We also find him discussing serious topics in art but it seems that he does not have specific interest in any particular philosophical trend. Passmore delineates himself as a *pessimistic humanist* who respected both human beings and human environments as perfectible. To quote him:

> I am willing to admit that there is no deed so dreadful that we can safely say 'no human being could do that' and no belief so absurd that we can safely say 'no human being could believe that.' But on the other side I point to the marvelous achievements of human beings in science and art and acts of courage, love, and self-sacrifice. I call myself a pessimistic humanist because I do not regard human

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[67] Passmore, John Arthur (1942, 1943, 1963), *Reading and Remembering*, Australian Army Education Service, Pamphlet No.1, Melbourne: Arbuckle Waddell Pty. Ltd.

[68] Passmore, J. A. (1952), *Hume's Intentions*, Cambridge: Cambridge University Press

[69] Passmore, J. A. (1961), *Philosophical Reasoning*, London: Duckworth

[70] Passmore, J. A. (1970), *The Perfectibility of Man*, Indianapolis: Charles Scribner's Sons

[71] Passmore, J. A. (1974, 1980), *Man's Responsibility of Nature: Ecological Problems and Western Traditions*, Indianapolis: Charles Scribner's Sons

[72] Passmore, J. A. (1957, 1968), *A Hundred Years of Philosophy*, London: Duckworth

[73] Passmore, J. A. (1991), *Serious Art: A Study of the Concept in All the Major Arts*, London: Duckworth

beings or their societies as being perfectible but a humanist I nonetheless am.[74]

We feel that logical positivism is back again and very much relevant to our present day philosophical discussion. With this in mind, we should rather say regarding Passmore's view that he would have been more relevant to comment upon a serious movement like the unified science movement. Passmore is a self-acclaimed pessimist. Hence he considers logical positivism as dead along with the unified science movement. Bertrand Russell also later on lost his interest in logical positivism.

Nonetheless, we have discussed in the section 4.1 of our dissertation that Moritz Schlick and Friedrich Waismann were in the domain of the strict verificationism and they guided a 'conservative wing' of the Vienna Circle. We already know that they both were connected with the communist party. On the contrary, Carnap, Neurath, Hahn, and Frank guided a group who took a liberal and inclusive view in their formulation and interpretation of the verifiability criterion of meaning. They began a movement called the 'liberalization of empiricism'.

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[74] Passmore, J. A. (1997), "Why I Am a Secular Humanist" *Free Inquiry,* Winter 1997, Volume 18, Number 1, Page 18

There has been much criticism of logical positivism by Quine, Hanson, Popper, Kuhn, Putnam, and Plantinga. This shows that logical positivism is not a dead and irrelevant issue. Soon after the World War II, it is true that logical positivism and the verification principle faced serious criticisms. The trouble arose within the members of the movement itself. Carnap adopted his theory of 'confirmation' and we also know that Ayer preferred his 'weak verification' principle. Philosopher like Hilary Putnam claims, *the verifiability criterion of meaning was itself unverified*.[75] Quine, the American logician, challenged conventional empiricist presumptions. Popper found virtue in metaphysics and in the meantime we know that he developed his scientific epistemology, also called falsificationism. This falsifying instrument insights that no number, degree and mixture of empirical success can either confirm or substantiate scientific theory. He criticizes the positivistic view and developed a kind of epistemology called *critical rationalism*, which insights human knowledge to germinate by conjectures and refutations. There he acknowledges the worth of positivistic movement, towards development of human understanding, but he also declares that he had *killed positivism*.[76]

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[75] Putnam, Hilary (1985), *Philosophical Papers: Volume 3, Realism and Reason*, Philosophical Papers, Cambridge: Cambridge University Press

[76] Popper, K. R. (1963), *Conjectures and Refutations: The Growth of Scientific Knowledge*, London: Routledge and Kegan Paul

Thomas S. Kuhn (1962) stood for his *foundationalism* after destabilizing verificaionism.[77] Hilary Putnam is the former student of Rudolf Carnap. Against the verification principle, Putnam puts four objections and these can be stated as follows:

1. Something is mentioned to as *observational* if it is evident straight with our senses. Then an observation term cannot be applied to things unobservable. If this is the case, there are no observation terms;

2. With Carnap's compartmentalization, some unobservable terms are not even theoretical and belong to neither observation terms nor conjectural terms. Some conjectural terms mention primarily to observation terms;

3. Documents of observation terms often comprise conjectural terms; and

4. A scientific theory may not comprise conjectural terms. [78]

Putnam assumes that positivism is actually a form of metaphysical idealism. Finally, we see that a huge demarcation line was there made against Schlick and Waismann. We know that they were communists.

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[77] Kuhn, Thomas S. (1962), *The Structure of Scientific Revolution*, Chicago: Chicago University Press

[78] Putnam, Hilary (1999), "Problems with the observational/theoretical distinction", in *Scientific Inquiry,* edited by Klee, Robert, New York: Oxford University Press, Pages 25–29

Carnap also identifies himself as a socialist. We see that he moves to Prague to take a university teaching position there at a German University. In Prague, his staying is cut short due to the rise of the nationalists and their capturing political power. With the help of Quine he moved to the United States. They met each other in Prague in the year of 1934. Carnap remains as a professor at the Chicago University from 1936 to 1952. Moritz Schlick is killed by his former student, Johann Nelböck, in 1936. In fact, all the Vienna Circle members move to other countries after the killing of Moritz Schlick. There was political motivation inside the circle to put walls against members. So the killing of Schlick is not enough to stop the unified science movement along with the logical positivism movement.

Finally, it is to be noted that Waismann was a physicist in the first place. He became a philosopher studying philosophy under the supervision of Moritz Schlick. Waismann was a lecturer in Oxford University and a reader in Cambridge from 1937 to 1939. In Oxford, he teaches the philosophy of mathematical philosophy, and in Cambridge, the philosophy of science. He takes British citizenship in 1938. But in the meantime, from 1927 to 1936, his position was very close to Ludwig Wittgenstein's views

on the philosophy of science and Mathematics. He had many conversations with Wittgenstein and he also recorded all these conversations. This conversation later on was published in 1967.[79] Moritz Schlick also used to sit and talk with Wittgenstein but that was not for so long as was with Waismann. In 1934, Wittgenstein and Waismann, agreed jointly to write a book. But their plan eventually turned out to be futile when their philosophical debates took quite different courses. Waismann blamed Wittgenstein for the obscurity of his philosophical position. Subsequently, a revised form of logical positivism of Vienna Circle is advanced by Kraft Circle. Victor Kraft led the way during the years 1952/53, Paul Feyerabend took the responsibility to move it forward.

Thus in conclusion we can fairly safely say that logical positivism is neither dead nor irrelevant for our time. It is true that there are philosophers who have no interest in this movement, but it is equally a fact that there are philosophers who have a lot of sympathy for logical positivism in its revised, modified and inclusive versions and formulations.

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[79] Waismann, Friedrich (1967), *Wittgenstein and the Vienna Circle, Conversation Recorded,* Edited by McGuiness, B. F., Translated by Schulte, J. and McGuiness, B. F., Oxford: Blackwell, Reprinted in 1979

References

Alston, W.P. and George Nakhnikian (1963), Eds., *Readings in Twentieth Century Philosophy*, London: Collier-Macmillan Limited

Ayer, A.J., et al. (eds.), (1963), "Vienna Circle", *The Revolutions of Philosophy*, London : Macmillan

Ayer, A. J. (1936), *Language, Truth and Logic*, 2nd Edition, London: Victor Gollancz Ltd., 1946

Ayer, Alfred Jules (1956), The Problem of Knowledge, Middlesex: Penguin Books Ltd

Ayer, A. J. (1959) editor, *Logical Positivism*, Glencoe, New York: The Free Press

Ayer, A. J. (1963), *The Revolution in Philosophy*, London: Macmillan

Ayer, A.J. (1966), 'What I Believe', *Humanist*, Volume 81, Number 8, August 1966

Bridgman, Percy Williams (1927), *The Logic of Modern Physics*, New York: MacMillan

Carnap, Rudolf (1922), *Der Raum: Ein Beitrag zur Wissenschaftslehre* [Space: A Contribution to the Theory of Science], *Kant-Studien*, Ergänzungshefte, number 56. His PhD thesis

Carnap, R. (1928a), *Der logische Aufbau der Welt*, Berlin: Bernary, Translated by R.A. George *The Logical Structure of the World*, Berkeley: University of California Press, 1967

Carnap, R. (1928b), *Scheinprobleme in der Philosophie*, Berlin: Bernary, Translated by R.A. George *Pseudoproblems in Philosophy*, in Translation of Carnap 1928a, Pages 301–343

Carnap, R. (1932a), "Überwindung der Metaphysik durch logische Analyse der Sprache", *Erkenntnis* 2, Pages 219-241, Translated by Arthur Pap "The Elimination of Metaphysics through Logical Analysis of Language", in Ayer (1959), Pages 60–81

Carnap, R. (1932b), "Über Protokollsätze", *Erkenntnis* 3, Pages 215-228, Translated by R. Creath and R. Nollan "On Protocol Sentences" in *Nous* 21 (1987), Pages 457–470

Carnap, R. (1934/37), *Logische Syntax der Sprache*, Wien: Springer, 1934, Revised edition Translated by A. Smeaton, *The Logical Syntax of Language*, London: Kegan, Paul, Trench Teubner & Cie, 1937, Reprinted, Paterson, NJ: Littelefield, Adams & Co., 1959

Carnap, R. (1935), *Philosophy and Logical Syntax*, London: Kegan Paul

Carnap, R. (1936), Testability and Meaning, *Philosophy of Science*, Volume 3, Number 4, October 1936, Pages 419-471, Published by: The University of Chicago Press on behalf of the Philosophy of Science Association, URL: https://www.jstor.org/stable/184400, Accessed on 09 April 2020

Carnap, R. (1938), "Logical Foundations of the Unity of Science", *International Encyclopedia of Unified Science* (Volume 1, Number 1), Chicago: University of Chicago Press, Pages 42–62

Carnap, R. (1939), *Foundations of Logic and Mathematics*, Chicago: University of Chicago Press

Carnap, R. (1942), *Introduction to Semantics*, Cambridge, Mass.: Harvard University Press

Carnap, R. (1950a), "Empiricism, Semantics and Ontology", *Revue International de Philosophie* 4, Pages 20-40, Reprinted in Carnap 1956a, Pages 205-221

Carnap, R. (1950b), *Logical Foundations of Probability*, Chicago: University of Chicago Press

Carnap, R. (1955), "Meaning and Synonomy in Natural Language", *Philosophical Studies* 6, Pages 33-47, Reprinted in Carnap 1956a, Pages 233-247

Carnap, R. (1956a), *Meaning and Necessity*, 2nd Edition with supplementary essays, Chicago: University of Chicago Press

Carnap, R. (1956b), The methodological character of theoretical concepts, *Minnesota Studies in the Philosophy of Science*, Volume 1 (1956), Pages 38-76, Minneapolis: University of Minnesota Press, Accessed on 09 April 2020 from the University of Minnesota Digital Conservancy, http://hdl.handle.net/11299/184284

Carnap, R. (1958), "Beobachtungssprache und theoretische Sprache", *Dialectica* 12, Pages 236-248, Translated as "Observational and Theoretical Language" in *Hintikka*, 1975, Pages 75-85.

Carnap, R. (1966), *Philosophical Foundations of Science*, New York: Basic Books, Reprinted as *An Introduction to the Philosophy of Science*, 1972, Reprinted, New York: Dover, 1996

Cartwright, N., Cat, J., Fleck, L., and Uebel, T. (1996), *Otto Neurath: Philosophy between Science and Politics*, Cambridge: Cambridge University Press

Cat, J., Cartwright, N. and Chang, H. (1996), 'Otto Neurath: Politics and the Unity of Science', in P. Galison and D. Stump, eds., *The Disunity of Science*, Stanford: Stanford University Press, Pages 347–69

Creath, R. The unity of science: Carnap, Neurath and beyond. In: Galison, P. & Stump, D. (Ed.), The Disunity of Science, Stanford: Stanford University Press, 1996, Pages 158-69

Da Cunha, Ivan Ferreira (2013), 'The Utopia of Unified Science: The Political Struggle of Otto Neurath and the Vienna Circle', *Principia*, published by NEL – Epistemology and Logic Research Group, Federal University of Santa Catarina, Brazil, Volume 17, Number 2, Pages 319-329

Ducasse, C. J., (1940), Concerning the Status of So-Called "Pseudo-Object" Sentences, *The Journal of Philosophy*, Volume 37, Number 12 (June 6, 1940), Pages 309-324, Published by: Journal of Philosophy, Inc., URL: https://www.jstor.org/stable/2018433, Accessed on 09 April 2020

Eames, Elizabeth R. (1989), *Bertrand Russell's Dialogue with his Contemporaries*, Carbondale: Southern Illinois University Press

Frank, Philipp (1949): *Modern Science and its Philosophy*, Cambridge: Harvard University Press

Friedman, Michael (1987), "Carnap's *Aufbau* Reconsidered", *Nous* 21, Pages 521-545, Reprinted in Friedman 1999b, Pages 89-113

Friedman, Michael (1988), "Logical Truth and Analyticity in Carnap's *Logical Syntax of Language"*, in W. Aspray and P. Kitcher, Eds., *Essays in the History and Philosophy of Mathematics*, Minneapolis: University of Minnesota Press, Pages 82-94, Reprinted in Friedman 1999b, Pages 165-177

Friedman, Michael (1992), "Epistemology in the *Aufbau*", *Synthese* 93, Reprinted in Friedman 1999b, Pages 114-151

Friedman, Michael (1999a), "Tolerance and Analyticity in Carnap's Philosophy of Mathematics", in Friedman 1999b, Pages 198-233

Friedman, Michael (1999b), *Reconsidering Logical Positivism*, Cambridge: Cambridge University Press

Gregory, Frank Hutson (1996), Arithmetic and Reality: A Development of Popper's Ideas, City University of Hong Kong, Working Paper No.WP96/01, Republished in *Philosophy of Mathematics Education Journal*, Number 26, December 2011

Goble, Lou (2001), *The Blackwell Guide to Philosophical logic*, New Jersey: Wiley-Blackwell, Page 309

Hahn, H.; Neurath, O.; Carnap, R. 1929 [1973], Wissenschaftliche Weltauffassung: der Wiener Kreis, (Scientific worldview: the Vienna Circle) Translated by Marie Neurath and Paul Foulkes. In: Neurath 1973, Chapter 9, Pages 304-10

Hacohen, Malachi Haim (2000), *Karl Popper: The Formative Years, 1902–1945: Politics and Philosophy in Interwar Vienna*, Cambridge: Cambridge University Press

Hempel, Carl Gustav (1935), "On the Logical Positivists' Theory of Truth", *Analysis* 2, Pages 49-59, Reprinted in Hempel, *Selected Philosophical Essays* (Edited by R. Jeffrey), Cambridge University Press, 2000, Pages 9-21

Hempel, C. G. (1963), "Implications of Carnap's Work for the Philosophy of Science", In: Schilpp Paul Arthur (eds), *The Philosophy Rudolf Carnap*, Open Court, LaSalle, Pages 685–710

Kant, Immanuel (1781), *Critique of Pure Reason*, Translated by Norman Kemp Smith, London: Macmillan

Kuhn, Thomas S. (1962), *The Structure of Scientific Revolutions*, (International Encyclopedia of Unified Science, volume 2, number 2), Chicago: University of Chicago Press, 2nd edition, 1970

Milkov, Nikolay (2013), The Berlin Group and the Vienna Circle: Affinities and Divergences. In: Milkov N. and Peckhaus V. (Eds.) The Berlin Group and the Philosophy of Logical Empiricism, *Boston Studies in the Philosophy and History of Science*, Volume 273. Springer, Dordrecht

Mises von, Richard (1951), *Positivism: A Study in Human Understanding*. Cambridge: Harvard University Press

Murzi, Maruo, "Rudolf Carnap (1891–1970)", *Internet Encyclopedia of Philosophy*, Accessed on 09 April 2020

Neurath, Otto (1932), "Protokollsätze", *Erkenntnis* 3, Pages 204-214, Translated and reprinted as "Protocol Statements" in Cohen and Neurath (1983), *Philosophical Papers*, Dordrecht: Reidel, Pages 91-99

Neurath, Otto (1935), "Einheit der Wissenschaft als Aufgabe", *Erkenntnis* 5, Pages 16-22, Translated as "The Unity of Science as a Task" in Cohen and Neurath (1983), Pages 115-120

Neurath, O. (1936), "Le Développement du Cercle de Vienne et l'avenir de l'empirisme logique" (The Development of the Vienna Circle and the Future of Logical Empiricism), *Actualités scientifiques et industrielles* (Scientific and Industrial Information), Paris: Hermann & Cie, Pages 8-59

Neurath, O., Carnap, R., and Morris, C. W. (orgs.), (1955), *International Encyclopedia of Unified Science*, Volume 1, Chicago: The University of Chicago Press

Neurath, O., Carnap, R., and Morris, C. W. (orgs.), (1970), *Foundations of the Unity of Science – Toward an International Encyclopedia of Unified Science*, Volume 2, Chicago: The University of Chicago Press

Passmore, John Arthur (1993), 'Logical Positivism', in *The Encyclopedia of Philosophy*, edited by Edwards, Volume 5, Page 56, Cf. Alvin C.

Platinga, 'A Christian Life Partly Lived,' Chapter 3, in *Philosophers Who Believe: The Spiritual Journeys of 11 Leading Thinkers*, edited by James Kelly Clark, Downers Grove, IL: InterVarsity, 1993, Pages 62-63

Passmore, J. A. (1942, 1943, 1963), *Reading and Remembering*, Australian Army Education Service, Pamphlet Number 1, Melbourne: Arbuckle Waddell Pty. Ltd.

Passmore, J. A. (1952), *Hume's Intentions*, Cambridge: Cambridge University Press

Passmore, J. A. (1961), *Philosophical Reasoning*, London: Duckworth

Passmore, J. A. (1970), *The Perfectibility of Man*, Indianapolis: Charles Scribner's Sons

Passmore, J. A. (1974, 1980), *Man's Responsibility of Nature: Ecological Problems and Western Traditions*, Indianapolis: Charles Scribner's Sons

Passmore, J. A. (1957, 1968), *A Hundred Years of Philosophy*, London: Duckworth

Pitcher, George (1964), *The Philosophy of Wittgenstein*, Prentice-Hall, Inc., Englewood Cliffs, N.J., USA

Popper, Karl Raimund (1935), *Logik der Forschung*, Vienna: Verlag von Julius Springer, first English edition as *The Logic of Scientific Discovery* published 1959 by Hutchinson & Co., First published by Routledge 1992

Popper, K. R. (1963), *Conjectures and Refutations: The Growth of Scientific Knowledge*, London: Routledge and Kegan Paul

Popper, K. R. (1999), *All Life is Problem Solving*, Translated by Patrick Camiller, Reprinted, London: Psychology Press

Putnam, Hilary (1978a), *Philosophical Papers Volumes 1 and 2*, Cambridge: Cambridge University Press

Putnam, H. (1978b), "There Is At Least One Apriori Truth", *Erkenntnis* 13, Reprinted in Putnam 1983, Pages 98-114

Putnam, H. (1981a), *Reason, Truth and History*, Cambridge: Cambridge University Press

Putnam, H. (1981b), "Convention: A Theme in Philosophy", Reprinted in Putnam 1983, Pages 170-183

Putnam, H. (1983), *Philosophical Papers* vol. 3, Cambridge: Cambridge University Press

Putnam, H. (1985), *Philosophical Papers: Volume 3, Realism and Reason*, Philosophical Papers, Cambridge: Cambridge University Press

Putnam, Hilary (1999), "Problems with the observational/theoretical distinction", in *Scientific Inquiry,* edited by Robert Klee, New York: Oxford University Press, Pages 25–29

Putnam, Hilary, and Paul Oppenheim (1958), "The Unity of Science as a Working Hypothesis", in Herbert Feigl, Grover Maxwell, Max Scriven (Eds.), *Minnesota Studies in the Philosophy of Science 2*, Minneapolis: University of Minnesota Press, Pages 3-36

Quine, W. V. O. (1936), "Truth by Convention", In: *Readings in Philosophical Analysis*, Selected and edited by Herbert and Wilfrid Sellars, New York: Appleton Century Crofts, Inc.

Quine, W. V. O. (1951a), "Two Dogmas of Empiricism", *Philosophical Review* 60, Pages 20-43, Reprinted in Quine *From a Logical Point of View*, Cambridge, Massachusetts: Harvard University Press, 1953, Revised edition, 1980, Pages 20-46

Quine, W. V. O. (1951b), "On Carnap's Views on Ontology", *Philosophical Studies* 2, Reprinted in Quine, *Ways of Paradox*,

Cambridge, Massachusetts: Harvard University Press, 1966, 2nd enlarged edition 1976, Pages 203-211

Quine, W. V. O. (1960), *Word and Object*, Cambridge, Massachusetts: MIT Press

Quine, W. V. O. (1963), "Carnap and Logical Truth", in Schilpp, P. A. (1963), Pages 385-406

Quine, W. V. O. (1969), "Epistemology Naturalized", in Quine, *Ontological Relativity and Other Essays*, New York: Columbia University Press, Pages 69-90

Ramsey, Frank Plumpton (1926), "Truth and Probability", in his Foundations of Mathematics, *Proceedings of the London Mathematical Society*, Volumes 2-25, Issue 1, 1926, Pages 338-384 (Received 23 August 1925 – Read 12 November 1925)

Ramsey, F. P. (1929), "Theories", Reprinted in Ramsey, F. P. (1978), *Foundations: Essays in Philosophy, Logic, Mathematics and Economics*, Edited by D. H. Mellor, London: Routledge, Pages 101-125

Reichenbach, Hans (1938), *Experience and Prediction: An Analysis of the Foundations and the Structure of Knowledge* , Chicago: University of Chicago Press

Reichenbach, Hans (1951), *The Rise of Scientific Philosoph*y, Berkeley/Los Angeles: University of California Press

Reisch, G. A., (2005) *How the Cold War Transformed Philosophy of Science*, Cambridge: Cambridge University Press

Russell, Bertrand (1900), *A Critical Exposition of the Philosophy of Leibniz*, Cambridge: Cambridge University Press

Russell, Bertrand (1912), *The Problems of Philosophy*, London: Williams and Norgate

Russell, Bertrand (1914), *Our Knowledge of the External World as a Field for Scientific Method in Philosophy*, Chicago and London: Open C Publishing

Russell, Bertrand (1918), The Philosophy of Logical Atomism, *The Monist*, Volume 28, Issue 4, 1 October 1918, Pages 495–527

Russell, Bertrand (1918), The Philosophy of Logical Atomism, *The Monist*, Volume 29, Issue 3, 1 July 1919, Pages 345–380

Russell, Bertrand (1918), *Mysticism and Logic and Other Essays*, London: Longmans, Green

Russell, Bertrand (1927), *An Outline of Philosophy*, London: George Allen & Unwin

Russell, Bertrand (1931), *The Scientific Outlook,* London: George Allen & Unwin

Russell, Bertrand (1940), *An Inquiry into Meaning and Truth*. New York: W. W. Norton & Company

Russell, Bertrand (1945), *A History of Western Philosophy and Its Connection with Political and Social Circumstances from the Earliest Times to the Present Day*, New York: Simon and Schuster

Russell, Bertrand (1948), *Human Knowledge: Its Scope and Limits*. London: George Allen & Unwin

Russell, Bertrand (1956), *Logic and Knowledge: Essays 1901–1950*, Edited by Robert C. Marsh, London: George Allen & Unwin

Russell, Bertrand (1956), *The Autobiography of Bertrand Russell*, 3 Vols. London: George Allen and Unwin

Russell, Bertrand; Slater, John Greer; and Frohmann, Bernd (1992), *Logical and Philosophical Papers*, 1909-13, Psychology Press, ISBN 9780415084468

Sarkar, Sahorta (1996), *The Scientific Conception of the World*, *The Emergence of Logical Empiricism: From 1900 to the Vienna Circle*, New York: Garland Publishing

Sahotra Sarkar and Jessica Pfeifer, Eds. (2006), *The Philosophy of Science: An Encyclopedia*, Volume 1: A–M, New York: Routledge, 2006, "Rudolf Carnap", Page 83

Savage, C. Wade, and C. Anthony Anderson (Eds.) (1989), *Rereading Russell: Essays on Bertrand Russell's Metaphysics and Epistemology*, Minneapolis: University of Minnesota Press

Schlick, Moritz (1931), "Die Kausalität in der gegenwärtigen Physik", *Die Naturwissen-schaften* (*Natural Sciences*), Volume 19, Pages 145–162; Translated as "Causality in Contemporary Physics" in Schlick (1979b), Pages 176–209

Schlick, Moritz (1936a), "Meaning and Verification", *Philosophical Review* 45, Pages 339-369, Reprinted in Schlick 1979b, Pages 456-481

Schlick, Moritz (1979a), *Philosophical Papers Volume 1 (1909-1922)* (Edited by Henk L. Mulder and Barbara van de Velde-Schlick), Dordrecht: Reidel

Schlick, Moritz (1979b), *Philosophical Papers Volume 2 (1925-1936)* (Edited by Henk L. Mulder and Barbara van de Velde-Schlick), Dordrecht: Reidel

Sigmund, Karl (2017), *Exact Thinking in Demented Times: The Vienna Circle and the Epic Quest for the Foundations of Science*, New York: Basic Books

Srinivas, Kunchapudi (2011), *Logical Positivism Revisited*, Delhi: D.K. Printworld (P) Ltd.

Stadler, Friedrich (2001), *The Vienna Circle. Studies in the Origins, Development, and Influence of Logical Empiricism.* New York: Springer, Page 199, 2nd Edition: Dordrecht: Springer, 2015

Symons, J., Pombo, O. and Torres, J. M. (orgs.) (2011), *Otto Neurath and the Unity of Science*, New York: Springer

Titus, Harold H. (1964), *Living Issues in Philosophy*, New York/Woodstock: The American Book Company

Uebel, Thomas (org.) (1991), Rediscovering the Forgotten Vienna Circle: Austrian Studies on Otto Neurath and the Vienna Circle, *Boston Studies in the Philosophy of Science*, Dordrecht: Kluwer Academic Publishers

Uebel, Thomas (2003), "On the Austrian Roots of Logical Empiricism" in *Logical Empiricism – Historical and Contemporary Perspectives*, Paolo Parrini, Wesley C. Salmon, and Merrilee H. Salmon, eds., Pittsburgh : University of Pittsburgh Press

Uebel, Thomas (2006), Vienna Circle, *Stanford Encyclopedia of Philosophy*, September 2006, Accessed on 09 April 2020,

URL: http://plato.stanford.edu/entries/vienna-circle/

Uebel, Thomas (2014), Vienna Circle, *The Stanford Encyclopedia of Philosophy*, Spring 2014 Edition, Edward N. Zalta (ed.), URL: http://plato.stanford.edu/archives/spr2014/entries/vienna-circle/, Accessed on 09 April 2020

Urmson, J.O. and Jonathan Rée, Eds. (1960), *The Concise Encyclopedia of Western Philosophy and Philosophers*, London: Routledge

Waismann, Friedrich (1967), *Wittgenstein and the Vienna Circle, Conversation Recorded,* Edited by B. McGuiness, Translated by J. Schulte and B. McGuiness, Oxford: Blackwell

Wittgenstein, Ludwig (1921), "Logisch-Philosophische Abhandlung", *Annalen der Nat. u. K. Philosophie* 14, Pages 185-262, Translated by C. Ogden *Tractatus Logico-Philosophicus*, London, 1922, Revised edition 1933, Reprinted, London: Routledge Kegan Paul, 1983