Ph.D. DISSERTATION

SCIENTIFIC BACKGROUND OF LOGICAL EMPIRICISM AND ITS IMPACT ON CONTEMPORARY PHILOSOPHY

Siddhartha Shankar Joarder

To my parents

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By

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C E R T I F I C A T E

Certified that the work incorporated in the thesis entitled "Scientific Background of Logical Empiricism and its Impact on Contemporary Philosophy" was carried out by Siddhartha Shankar Joarder under my supervision.

Professor Dr. A.K.M. Haroonar Rashid

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DECLARATION

The work in this thesis is original and has not been submitted by me to any university or institution for the award of any degree or diploma.

Such material as has been obtained from other sources is duly acknowledged in the thesis.

Siddhartha Shankar Joarder

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P R E F A C E

Logical empiricism, a powerful philosophical doctrine, makes a great stir, as the central strand, in the philosophical kingdom at the turn of the twentieth century. It is flourished in the 1920s as a revolutionary force and developed in the line with Weimar culture. Indeed, its overwhelming influence on scientific philosophy has been envisaged as a revolution in post-Humean empirical thoughts. Its influence on science has been characterized with a sense that human knowledge is entirely based on sense experience. So, the philosophy based on experimentation and observation, it is believed, creates an especial space and takes hold the very essence of science. As a matter of fact, many philosophers unhesitatingly call the period 'a turning point in philosophy' in the long course of philosophical inquiry. Truly, this philosophy was developed within a period which is substantially taken as the most illustrious moment of physics—the physics of relativity and Quantum mechanics. In addition, the science of language also adds to the fore to enhance the space of scientific philosophy during this time. Very consistently, linguistic philosophy takes the responsibility equally to mark the scientific background of logical empiricism.

In epistemology, empiricism as a source of knowledge always suffered from stiff challenges. Naturally logical empiricism has to face same challenges from the detractors with different tones. Many philosophers believe that T. S. Kuhn, W.V.O. Quine, Alonzo Church, for example, drive the last nail into the coffin of the movement. It is believed that these philosophers spade up basic problem in scientific method i.e. the method of induction with number of logical weakness. Accordingly, the principle of verifiability—the main weapon of destruction to justify science--non-science division has been attacked by the critics immensely. So, many commentators declare its philosophical death soon after its formal disintegration following World War II. However, these sweeping charges are partially ill-founded. Since these two physics work with the reputation in the natural science, the importance of logical empiricism doesn't wane. It is the main agenda of my thesis here to find a relation between modern physics and logical empiricism with references to some leading empiricists.

Modern physics touches a point of new horizon which overturns older fashion of classical mechanics. Classical mechanics, empowered by Isaac Newton, mostly revolves round Euclidean postulates. And the motion of physical object, in this physics, has been described as the inertial reference frames. The notion of *space* and *time* are wholly constructed within the structure of *a priori* principle. But, in turn, the message of non-Euclidean geometry shakes the foundation of classical physics. In addition, the object moving fast near to light

must breaks down the law of classical mechanics. David Hume and Ernst Mach pick up the traditional views of Euclidian geometry and pave the way for windows of a new physical theory. Albert Einstein makes the best use of it and defaces the most powerful interpretation of physical theory of nature. In my thesis, I have tried to make the bridge between philosophy of relativity theory and logical empiricism in the sense that both the philosophies accentuated the importance of sense observation.

Moreover, the philosophy of quantum mechanics develops at the same time has had a profound influence on it. Neils Bohr and Werner Heisenberg chief architect of the whole physics bring the physical interpretation as a non-realist. The profundity of such physical nature stands very closely to the empiricist's strand. Quantum physics, another revolution in the physical world tremendously pushes us an uncertain glory that only *inspire not to ask any question beyond what is likely to be appearance.* W. Heisenberg invents the principle of uncertainty that obviously finds indeterminacy of electron's mass and velocity at the same moment. As a result, scientists assume that *there can never be any sense of reality beyond appearance*.

I am indebted to my supervisor Dr. A.K. M. Haroonar Rashid, professor of philosophy at Dhaka University for his kind and thoughtful guidance. Truly, it would never have been possible to put an end to my thesis without his encouragement and continuous inspiration. I am also delighted to felicitate my teacher professor Dr. Sajahan Miah with whom I have discussed at times to improve my ideas. I would like to felicitate my teacher Professor Dr. Pradip Kumar Roy, Chairperson in Philosophy at Dhaka University for his inspiration and support. I will take the opportunity to thank Christopher Pincock, Professor at Ohio University, George A. Reisch, professor at Northwestern University, Professor Steve Schwartz, and Professor Mehdi Nasrin along with some professors of the West for their kind support to send their valuable matter. As soon as I make an urge to them, they responded instantly to my appeal. Thanks are also due to Jagannath University, Dhaka for giving me one-year study leave with full pay during the time. I am also grateful to my teachers, friends and colleagues for their excessive generosity and constant inspirations.

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C O N T E N T S

1

INTRODUCTION

Logical empiricism (Moritz Schlick prefers to designate it consistent empiricism[1]) is a philosophical school or a movement which is centrally concerned with science. Indeed, in logical empiricism, two distinct ideas "empiricism" and "logical" has been conjoined together in order to reconstruct the logical structure of scientific knowledge. It just signifies the rules which can be connected between observation statements and scientific hypothesis or theories. Historically, it is 'a movement or school that epitomized or typified analytical philosophy in the middle of twentieth century'[2] which is originally characterized as a vanguard of scientific thoughts. A scientific picture of nature through the logical construction of language has been brought under consideration by the logical empiricists. In a view to drum up the project, a good number of science-minded philosophers along with some pure scientists from different disciplines came under a same umbrella. In a very strict sense of the term logical empiricism is an especial doctrine of scientific philosophy which believe that all knowledge is based on valid inference grounded on observable facts. No knowledge is, therefore, possible and cognitively significant thereupon without having relation with sense perception. Very succinctly, its aim is to provide a demarcation line between philosophy and non-philosophy. They believe, however, that philosophy should be something which can wholly be critical i.e. empirical. Non-philosophy, on the other hand, is to be designated which is mostly uncritical or devoid of proper logical functions. As a consequence, they do not allow any so-called speculative inquiry in order to find out the "ultimate principle" or something like that. This is clearly reflected in their manifesto published in 1929 entitled, *WissenschaftlicheWeltauffassung.* Its basic slogan was *Der Wiener Kreis*or "The Scientific World-Conception: The Vienna Circle". It 'provided an importantly new understanding of the nature of empiricism and a new rejection of metaphysics'[3]. For as much, Logical empiricism as a new account of analytical

[1] Moritz Schlick in his "Positivism and Realism" writes, 'the designation "consistent empiricism" seems to me to be appropriate. For details A.J. Ayer(ed.),*Logical Positivism,* The free Press, Glencoe, Illinois, 1959, p.106. I do not wish to find out the cause of Schlick's idea, why does he replace the term "consistent" instead of "logical". But, it may assume that Schlick prefers the term in order to be distinct from other empiricists. It must be noted that the name "logical empiricist", "logical positivist", or "neo-positivist" is given by Herbert Feigl and A.E. Blumburg in 1931(Paul Edwards, *Encyclopedia of Philosophy,* Vol.5 pp.52,57.Macmillian, N.Y) and the designation is first used in the international Congress for Unity of Science in Paris in 1935.For detail, B. Von Juhos in Mind, 1937.

[2]Alan Richardson and Thomas Uebel, (ed.) *The Cambridge Companion to Logical Empiricism,* Cambridge University Press, 2007, p. Introduction

[3]*ibid,.* p. Introduction

philosophy represents the whole sectarian beliefs of science-minded scholars at least for some decades. Friedman exposes as thus:

> 'Logical positivism is one of the central strands in the fabric of twentieth century thought. Originating in Austria and Germany in the 1920s, during the exuberant "modernism" of the Weimar period, it was intimately intertwined with some of the most important scientific developments of the new century: in particular, with the development and propagation of Einsteinian relativity theory and with the great debates on the foundations of mathematics that culminated in Gọdel's celebrated incompleteness theorems. Indeed, Einstein was on close terms with several of the leading members of the logical positivist movement-with Moritz Schlick, the founder and guiding spirit of the Vienna Circle, Hans Reichenbach, the leader of the Berlin Society for empirical society-and Godel was himself a part-time participant in Vienna Circle'.[4]

It is commonly believed that philosophers of logical empiricism were an advocate of epistemological anti-foundationalism[5]. It is also conceived that it is a logical development of post-positivistic ideas of Auguste Comte (1798--1857) who is respected as a harbinger of societal revolution in French and a philosopher of science as well. Comte paves the way to make a foundation of positivistic philosophy at the early stage of eighteen century. It is taken that, '[t]he logical positivists accepted this classification and those of Auguste Comte's law of three stages' in which all knowledge and societies dialectically pass through theological metaphysical to positive or scientific stage.'[6] Robert C. Scharff examines that Comte was the first positivist in history who is equally relevant to the present days. Scharff explains:

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[4]Michael Friedman, *Reconsidering Logical Positivism,* Cambridge University Press, 1999, p.xi [Friedman also points out that logical positivism was actively involved with the revolutionary socio-cultural and political struggles of the period.]

[5]Epistemological foundationalism asks to the structure of our scientific beliefs whether it depend on some previously accepted beliefs or not. Logical empiricists particularly divided on this issues in which some (Otto Neurath for example) believes that scientific knowledge in great part arises out of coherence set of our accepted ideas . But others (Moritz Schlick at least) do not hold it. They believe that scientific knowledge can only be accepted when ultimately it is verified by experience not by other beliefs. Thomas E. Uebel has refuted the ideas of foundationalism concerning the methodological views of LE in his article "Anti-Foundationalism and the Vienna Circle's Revolution in Philosophy' British Journal for the Philosophy of Science, 47, pp.415—40. Ubel says, none of the logical empiricists were the proponents of logical foundationalism. But, Thomas Oberdan in a discussion on "The Vienna Circle's "Anti- Foundationalism' proves that Uebel's claim is ungrounded and he proves that Schlick is a foundationalist. For detail Thomas Oberdan, The Vienna Circle's "Anti- Foundationalism', British journal for Philosophy of Science, 49(1998), 297—308.

[6]AmaechiUdefi, "Metaphysics and the Challenge of Logical Positivism: An Interrogation", Journal of Social Science, Nigeria, 21(1): 7-11, 2009, p.8.

> For Comte, the positive stage begins when the nominalistic and anarchic implications of metaphysics push the mind toward subordinating itself to observation. For this to happen, however, the whole tenor of intellectual expectation that characterizes both theology and metaphysics must change. Speculation can no longer be regarded as providing absolute knowledge of what lies above, behind, or within the things we encounter.[7]

But the difference between early and later positivism is that former was naïve formulation of positivistic ideas, however, the later thoughts are entirely critical and based on modern logic. Accordingly, some other names of this doctrine were substantiated by other followers as "critical empiricism" or "neo-positivism" and of course "logical positivism". The aim of this entire project is to comprehend the whole universe according to the criterion of science. No doubt, the whole issue is marked as a highly epistemic function of scientific realization. I will recapitulate the whole function of the development in this section on the basis of historical evidence. Here, I will also stress on the point in which those philosophers were inspired much. As an introductory note, I will bring forward some important assumptions here and try to make the illustrations accordingly. These are: a) logical empiricism is wholly science oriented thoughts which is fundamentally different to previous speculative believes, b) it is a development of post-Kantian theory, c) philosophically very close to the doctrine of non-Euclidian geometry and the theory of relativity, and d) higher stage of empiricism as an acrid repercussion against Hegel and Bradlian idealism.

Logic can justify the language which is used as the phraseology whereas empirical statement refers to "fact" and at the last resort it entails the responsibility on the "reality". This philosophical doctrine of Vienna Circle is logical empiricism. This especial group of philosophers has been identified as logical empiricists or logical positivists or Neo-Positivists. This name was given by Herbert Feigl and A. E. Blumberg in 1931.[8] And the designation was first used in the International Congress for

[7] Robert C. Scharff*, Comte after Positivism*, Cambridge University Press, 1995, p. 87.

[8]Paul Edwards,(ed.) "Logical Positivism", in *Encyclopedia of Philosophy*; Vol.-5, pp.52-57, Macmillan, New York. [Logical Empiricism: this especial movement of philosophy was formally started at the beginning of twentieth century but its name was not exactly fixed until the beginning of forties. Herbert Feigel and A. E. Blumberg two important members of Vienna Circle have proposed this name. Though the name Logical Positivism or Logical Empiricism or Neo-Positivism have the same import but Moritz Schlick(1882 -1936) who is thought to be the nucleus of Vienna Circle preferred for the name of Logical Empiricism rather than Logical Positivism or Neo–Positivism.]

Unity of Science in Paris in 1935.[9] This is the fact that Logical empiricism, though a new dimension of scientific-philosophy, nevertheless, its deep root lies in ancient analytical thoughts of Greek philosophers like Plato, Aristotle and Pythagoras among many other philosophers of West. My project rounds two important issues before and after this philosophical development and also the middle of their activities on which they employed their efforts. I will employ my entire project to seek the linkage between logical positivism and modern physics; and then its different extension with critical assumptions. The later part of my thesis is involved to seek the outcome of effects on various philosophical developments in recent time as well.

In this official statement[10], principal aims are set out as follows: first, to provide a secure foundation for the sciences, and second, to demonstrate the meaninglessness of all metaphysics. Besides these principles, I think, an important goal of logical empiricism is to establish philosophy on a firm basis in order to let it acceptable for all. Philosophy in its long history has been overshadowed by the so called speculative jargon that needs to be shrugged off. If philosophy needs to be envisaged as a distinct branch of knowledge it must purge away metaphysical hyperbole from its cognitive activities. The meaningless and abstruse assertions of metaphysics create much confusion among the people especially the philosophers who want to do away with the line between philosophy and science. Rudolph has pointed out two fundamental doctrines of logical empiricism: i) that proposition of existential import has an exclusively empirical reference; ii) that this empirical reference can be conclusively shown by logical analysis.[11]

Moritz Schlick (1882--1936), the central figure of logical empiricist movement was an interpreter of Albert Einstein, the greatest physicist in the history of scientific inquiry. He is known to be a scientist rather than philosopher. In his time he is considered to be a renowned physicist[12] of recent development. His good number of essays on physics,

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[9] This is taken from the thesis paper *Principles of Logical Empiricism* by B. Von Juhos.(translated from German by Dr. Annette Herzman, *Mind*, 1937).

[10]Official statement:"WissenschafylicheWeltauffassung" Der Wienner Kreis, Wien, 1929, s.15ff. This statement is used by Julies Rudolph Weinberg in *An Examination of Logical Positivism,* Routledge and Kegan Ltd, Broadway House:68-74 Cater LaneE.C.4. Rudolph in his Introduction in the An *Examination of Logical Positivism,*has pointed out the basic principle of logical Empiricism.

[11] Rudolph Weinburg, *An Examination of Logical Positivism*, Routledge&Kegan Ltd, Broadway House: 68-74 Cater Lane, E.C.4, 1936, p.1.

[12]Schlick studied at the University of Heidelburg, Germany and finished his Ph. D at the University of Berlin. Under the supervision of Max Planck he makes his dissertation titled "On the Reflection of Light in a Non-Homogeneous Medium". Following couple of years he turns his attention to

especially on the theory of relativity and other problems of space and time, attracts huge interest of later philosophers. At the age of forty he comes to the University of Vienna from Kiel in the early 1920s. He is appointed as a professor of inductive science to strengthen the empirical traditions at Vienna, the post which once occupied by Ernst Mach (1838--1916), physicist Ludwig Boltzmann (1844--1906) and later Adolf Stoehr (1855-1921). There had already been an anti-metaphysical atmosphere in Vienna following Mach's orthodox empirical strand. S. Sarkar says, '[t]he members of the Vienna Circle had an almost worshipful attitude towards the new physics though, in general, they seemed to have been completely ignorant of the equally fundamental changes taking place in biology.[13] Victor Kraft says, 'empiricist tendencies had in a sense asserted themselves through Franz Brentano. Theodor Gomperz and Jodl had represented anti-metaphysical philosophy'[14]. Schlick was employed there to invite scientists and philosophers in order to discuss philosophical problem in science on every Thursday evening in Chemistry building. His background was physics; did Ph. D under the supervision of Plank on the topic of light reflection in non-homogeneous media. His book *Space and Time in Contemporary Physics* is a nice interpretation of the theory of relativity published in 1917. At the outset, they preferred to call themselves Ernst Mach Association, which later turns to be Vienna Circle[15]. A.J. Ayer, a very young and stout-hearted man, joined with them around the first half of 1930's and following his joining the circle got their breath and 'boosted the image'. His *Language, Truth and Logic* exasperated the atmosphere beyond imagine. Victor Kraft, also a member of the circle, narrated the entire atmosphere as such:

> Soon a circle formed itself around Schlick in Vienna, consisting not only of students but also of intellectuals interested in philosophy. It contained the most

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philosophy of science and epistemological discourses. During the time of exuberance of new physics he explains Einstein's theory of relativity and modern concepts of space and time.

[13] S. Sarkar,(ed.),*The Emergence of Logical Empiricism: From 1900 to the Vienna Circle*, A Graland Series in Readings in Philosophy, Harvard University, 1996, p. viii.

[14] Victor Kraft, *The Vienna Circle, The Origin of Neo-Positivism*, Philosophical Library, New York, 1953, p.9.

[15] Friedrich Stadler writes in his article The Vienna Circle Context, Profile and Development, 'The so-called Vienna circle of logical empiricism first came to public attention in 1929 with the publication of manifesto entitled Wissenschaftlicheweltauffassung Der Wiener Kreis (the scientific world-conception. The Vienna Circle) published for Ernst Mach Society, this influential manifesto – dedicated to MortizSchlick, the titular leader of the Vienna Circle –was signed by Rudolf Carnap, Hans Hahn, and Otto Neurath, who may be regarded as its editors, and with Herbert Feigl, its authors (Mulder 1968). The name "Vienna Circle" was originally suggested by Otto Neurath who wanted to evoke pleasant associations with "Vienna Woods" by alluding to the local origin of this collective(Frank, 1949, 38). [Richardson and Thomas Uebel (ed.), *The Cambridge Companion to Logical Empiricism*, Cambridge University Press, 2007, p.25.]

> advanced students of his--among them Fr. Waismann was outstanding –,but also accomplished Ph. D's. Neurath, E.Zilsel, H.Feigl,B.v. Juhos, H. Neider, further some of his closer or remoter colleagues, viz. lecturers Rudolf Carnap, V. Kraft, F. Kaufmann, and by no means just "pure" philosophers, but likewise philosophically interested mathematicians: professor H. Hahn and lecturers Menger, Radakovic, and Goedel. The indicated composition of the circle was responsible for an unusually high level of discussion. The mathematical representation– Carnap, Waismann, Zilsel, Neurath, and Kaufmann too were mathematically competent—reinforce the tendency towards logical rigor and precision.[16]

In almost same time another group in Berlin led by Reichenbach came into prominence and contributed the same. This group is prominently called Berlin Group. Many scholars somehow give the importance of Vienna circle than Berlin group, but the researchers find that '[t]he Vienna circle and the Berlin Group were schools of scientific philosophy that together strove against what they understood to be a philosophical traditionalism that lost touches the real world. The term "logical empiricism" as this scientific philosophy came to be called in the last years, can be seen as the philosophy of the two Germanic capitals, Berlin and Vienna. .. The cultural milieu in which the new scientifically oriented philosophy was nurtured departed perceptibly from what had long been the traditional seedbed of Germanophone philosophy, namely the small university town such as a Marburg or a Graz or a Jena.'[17] N. Milkov finds that Berlin Group was no less than Vienna because *The Theory of Relativity and A priori Knowledge* (1920) of Reichenbach made a useful contribution to the group. It is historically important to find the linkage between these two groups where the groups distinctly perform with each other. Berlin Group engages to find the rapport between philosophy and mathematics, on the other hand Vienna group 'was to advance specific theories: for example, to reach consensus on the question of "protocol sentence".[18]Among other members of the group Grelling, Dubislav, Alexander Herzberg, Fritz London, Wolfgang Kohler, Kurt Lewin, Carl Hempel, Olaf Helmer, Valentin Bargmann, and Martin Strauss were prominent[19].

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[16] Victor Kraft, *The Vienna Circle, The Origin of Neo-Positivism,* Philosophical Library, New York, 1953, p.10.
[17]NikolayMilkov and V. Peckhaus (ed*.) The Berlin Group and the Philosophy of Logical Empiricism Boston Studies in the Philosophy and History of Science*, 2013, p. 3. The Berlin Group and the Vienna Circle,
[18]*ibid*.,p.5.
[19]*ibid.,* p.9.

During the middle of 1920s they were greatly influenced by mathematical logic of Gottlob Frege (1848--1925) and Bertrand Russell (1872--1970). Ludwig Wittgenstein's (1889--1951) *Tractatus Logico-Philosophicus* become the central point of their discussions along with the logical theory of symbolism besides 'picture' and 'model' theory of language[20]. Rudolf Carnap (1891--1970) and Otto Neurath (1882--1945) second and third member[21] of this movement respectively, dedicated their every effort to establish this iconoclastic mode of approach. Their platform and aim was identified as anti-metaphysical because of their close affinities with modern science and it obviously expresses anti-Hegelian and anti-Bradleian doctrine. Stadler writes, '[t]he term scientific "world-conception" (Weltauffassung) intended to signal a sharp contrast with the metaphysically informed German "worldview" (weltanschauung) and to stress its scientific orientation.'[22]

Their movement is basically propelled against orthodox belief of traditional philosopher and parochial socio-scientific views of stereotype mind. The entire history of philosophy becomes burdensome, they think, with the barren and unfruitful discussion. The problem arises from an effort to answer without knowing what question we need to solve. They believe, this is the metaphysicians or idealists very grossly said, make the twist over some simple issues in philosophy which appear to be unwarranted and the most complicated problem for knowledge construction. Therefore, their whole interest centered round unification of science and very precisely, expulsion of ambiguity from the philosophy of science. Scientific knowledge, they believe, is knowledge of objective truth. So, they constitute a frame of reference from where they demand a confusion-free scientific knowledge.

Accordingly, they issued a rule of justification for those linguistic problems which remains unexamined in history. The only way to justify, they think, is to introduce a criterion by which meaningful discussions can be counted. For the purpose, the aim had been fixed up to disintegrate the traditional philosophy. It has a wide range of impact on contemporary philosophical development which surpassed modern philosophical

[20] Picture theory is basically considered as the correspondence theory of truth. Every meaningful proposition is a picture of atomic facts. Wittgenstein is the exponent of this theory in which he states that statement would only be meaningful if it express or define the real world.

[21] The order which is maintained here namely; second and third, have been taken from an exclusive interview with A. J. Ayer. In an interview with Professor Brayan Magee, Ayer has had a long talk on logical positivism and it's Legacy.[the soft copies of these interview (section-1 to section-4) can be found on You tube under the heading of Logical positivism and its Legacy].

[22] Friedrich Stadler "The Vienna Circle Context, Profile and Development" in *The Cambridge Companion to Logical Empiricism*, Cambridge University Press, 2007, p.26.

thoughts to socialism, internationalism etc. Stephen Priest writes about logical empiricism: 'It is sometimes maintained that logical positivism is a conservative movement politically and philosophically, in the history of ideas. This view is wholly mistaken. In the 1940s and 1950s logical positivism was a radical movement self-consciously iconoclastic in its devastation of received philosophical orthodoxy. Central among its targets was concepts of God and soul'.[23]

Vienna circle within this period (1920s –1950/60s) has had a remarkable successes in almost all areas of science and epistemology. They met with each other one after another with different issues (Quantum physics, Problem of causality, Biology, Psychology, Logical Symbolism with many others) at different places in Europe. This is not true that they were wholly acknowledged with same issues because many issues were debated vigorously with different solutions. Russell, Karl Popper, Wittgenstein, along with many philosophers were not interested in the basic tenet of logical empiricism but they met with them on occasion.

Within a short course of time Vienna Circle was disintegrated. One of an important cause is the outbreak of Second World War. Many philosophers were fled away to save themselves from Nazi attack. Ayer writes, 'The German occupation of Austria dispersed the Circle. So far I know, only Neurath, Feigl, and Waismann among its members were Jewish but the radical spirit of the group, and its rational outlook, made it unacceptable to the Nazis.[24] He also describes the last episode of the circle as such: 'Carnap holding a professorship first at Chicago and then in California. Frank, going to Harvard, Menger to Notre Dame, Godel perhaps the most gifted of them all, to the institute at Princeton'.[25] Very lastly, Ayer sees the whole initiative in this way, ' If one goes through the theses advanced in the early numbers of *Erkenntnis* in detail one finds that nearly all of them are questionable and many of them false. But, their spirit still triumphs. A strain of what I can best describe as woolly uplift was banished from philosophy—I daren't say never to return, that would be too optimistic – but where it survives or reappears, it has at least to face criticism of a keenness which we owe very largely to those heroes of my youth.'[26] Michael Friedman points out that, 'Logical positivism also was actively involved with the revolutionary socio cultural and political

[23]Stephen Priest, *The British Empiricists,* Routledge, London and New York, 2007, p.238.
[24]Ayer, *Freedom and Morality and Other Essays*, Clarendon Press, Oxford, 1984, Chap. 9, p.175.
[25]*ibid,,* p.176.
[26]*ibid.,* p.177.

struggles of the period and, in particular, with the movement for a *neue Sachlichkeit* in both society and the arts typified by the Dessau Bauhaus'[27]

I believe that in spite of its 'sad demise' it leaves remarkable vestiges in different points of modern philosophical doctrines. Many contemporary philosophical schools arise after this most striking philosophical development of 20th century. I think it needs reappraisal and revision of the whole attitude: how the scientific background of this movement inspired them to involve themselves in this especial kind of epistemological enquiry. Moreover, it needs to recapitulate their basic program in which point they were intertwined with.

1.1 Ludwig Wittgenstein and his early thoughts

Carnap writes in his *Intellectual Autobiography*:

> For me personally, Wittgenstein was perhaps the philosopher who, besides Russell and Frege, had the greatest influence on my thinking. The most important insight I gained from his work was the conception that the truth of logical statements is based only on their logical structure and the meaning of the terms. Logical statements are true under all conceivable circumstances; thus their truth is independent of the contingent facts of the world. On the other hand, it follows that these statements do not say anything about the world and thus have no factual content.[28]

Carnap's candid avowal towards the contribution of Wittgenstein (1889-1951), I believe is not only of his personal confession but also of almost all logical empiricists. It is very interesting that Wittgenstein was neither a logical empiricist nor a fully-fledged philosopher in a sense but his early thoughts pushed the whole circle to an amazing climate. It is also important to note that he was one of the major critics of logical empiricism. A single published book during any one's life-time perhaps never has had such influence ever as regards to Wittgenstein's *Tractautus Logico-Philosophicus.* His posthumous publication *Philosophical Investigation* appeared in 1951which is definitely different from his earlier *Tractaus*. So, he is always discussed as "early" and "later" Wittgenstein. Even though, his *Tractatus* is considered as the key work of the doctrine

[27]Michael Friedman, *Reconsidering Logical Positivism,* Cambridge University Press, (1999), preface.
[28]Carnap, *Intellectual Autobiography*, in Schilpp, 1963, pp. 3-84. [This excerpt has been quoted from Friedmann' s*Reconsidering Logical Positivism,* p.177.]

which, I think, has had a crucial influence on the whole enterprise. Professor Steve Schwartz, very interestingly, claims that 'If Frege is the pioneer and Bertrand Russell the father of analytic philosophy, and then Wittgenstein's writings provided the backbone'.[29]I believe that Wittgenstein had an enormous influence on analytical philosophy perhaps more than one reason, i) he was much straight in his style and position ii) none was so stout before him who attempts to depict the real picture of the world through language. Russell in the long introduction of *Tractatus* avows its supremacy without hesitations. In the first line he writes, 'MR. WITTGENSTEIN'S *Tractatus Logico-Philosophicus,* whether or not it prove the ultimate truth on the matters with which it deals, certainly deserves, by its breadth and scope and profundity, to be considered an important event in the philosophical world.'[30] The members of the circle were assigned to read the book thoroughly and inspired themselves to define positivistic program minutely. The importance of Wittgenstein's new doctrine is much more important and no doubt, that was acclaimed unhesitatingly by his contemporaries including Russell. An especial letter to Lady Ottoline Morrell Russell expressed this wish[31] which conspicuously expounds his ingenuity. Now the question is how Wittgenstein influenced logical empiricism? Or, what are the fundamental ideas of *Tractatus* in which they found to be worth understanding?

Wittgenstein's basic idea about world and language has been expressed in different and peculiar way. Positivists have many reasons to get inspired from the pamphlet. He writes, '[t]o understand a proposition means to know what is the case if it is true'.[32] In *Tractaus,* Wittgenstein argues,: it is necessary to understand the relation between language and thing, because, world reflects in language and since language is expressed in propositions so we need to make a proper relation between them. So, Wittgenstein starts with the operations to the 'logical structure of propositions' and 'the nature of logical inference'. In order to get a logically perfect language he deals with Symbolism. Language consists of propositions which he thinks to be compound. This compound proposition further consists of elementary propositions. Finally, elementary propositions

[29] Steve Schwartz, *A Brief History of Analytic Philosophy: From Russell to Rawls*, 1st edition, Wiley and Sons, Inc, USA, 2012, p. 48.
[30] Ludwig Wittgenstein, *TractatusLogico-Philosophicus,* trnsl. C.K Ogden, Kegan Paul Trench, Trubner& Co. Ltd. 1922, Introduction.
[31] Russell writes a letter to Ottoline which I think is very relevant for the purpose. He writes, 'It has long been one of my dreams to found a great school of mathematically- minded philosophers, but I don't know whether I shall ever get it accomplished. I have hopes of Norton, but he not the physique, Broad is alright, but has no fundamental originality. Wittgenstein of course is exactly my dream. 29, December 2012.
[32] Ludwig Wittgenstein, *Tractatus Logico- Philosophicus*, prop. 4.024, London, 1961.

are the collection of "names". On the other hand, world is composed of facts. And the fact is a combination of "state of affairs". Lastly, "object" is the ultimate constituents of "state of affairs". Very interestingly Wittgenstein announces that there is a symmetrical relation between the stage of language and the phases of world with which it is composed, viz. "objects". He argues that arrangements of names logically picture the objects and since "names" represents the "objects" the elementary propositions (composed of name) are taken to be meaningful. Wittgenstein advocates that, '[a] logically perfect language has rules of syntax which prevent nonsense, and has single symbols which always have a definite and unique meaning.'[33]

Wittgenstein believes that the problem of philosophy, actually, rests on misunderstanding of the logic of our language. And to end up this problem he opines the needs to draw the limit of 'expressions of thoughts'. In order to formulate this principle he summed up the whole project as such: 'what can be said at all can be said clearly; and whereof one cannot speak thereof one must be silent.'[34]

I think the positivists got the inspiration from the *Tractautus* from some basic objectives: a) the idea of meaningful or meaningless propositions (may) have been drawn from Wittgenstein, I believe. Moreover, Wittgenstein very clearly makes the distinction. He explains that if any sign or string of signs fails to express proposition it must be thrown as meaningless. At the last, he suggests that '[m]y proposition is elucidatory in this way: he who understands me finally recognizes them as senseless, when he has climbed out through them, on them, over them. (He must so to speak through away the ladder, after he has climbed up on it.) He must surmount these propositions; then he sees the world rightly.'[35] b) Wittgenstein was the first to articulate the true nature of logical truth itself; the truths of logic are tautologies that necessarily hold in all possible circumstances and hence say nothing about the world.[36]

1.2 Vienna Circle and the rise of science

In 1895, University of Vienna created a post of inductive science in order to enhance empirical traditions and to boost philosophy of science. Ernst Mach (1838-1916), popular physicists at that time, was appointed as a professor for the post. Meanwhile, his

[33] Wittgenstein, Introduction,
[34] Wittgenstein, Preface
[35] Wittgenstein, p.90.
[36] Friedman, *Reconsidering Logical Positivism*, p.177.

The Science of Mechanics (1883), *The Analysis of Sensation* (1897) and *Popular Scientific Lectures* (1895) became more prominent within this time and created much enthusiasm to the readers. Einstein was immensely motivated and influenced by Mach for his scientific thoughts particularly his ideas of what Einstein called "Mach's Principle"[37].He writes in his autobiographical notes: '[t]oday everyone knows, of course, that all attempts to clarify this paradox [of light that leads to special relativity] satisfactorily were condemned to failure as long as the axiom of absolute character of time, or of simultaneity, was rooted unrecognized in the unconscious. To recognize clearly this axioms and arbitrary character already implies the essentials of the solution of the problem. This type of critical reasoning required for the discovery of this central point was decisively furthered, in my case, especially by the reading of David Hume's and Ernst Mach's philosophical writings.'[38] It is fairly judged that Einstein in his many writings[39]expressed his gratitude and reverences towards Hume and Mach for his "physical theorizing". It is evident that the idea of absolute "space" and "time" was much shattered by Mach shortly before Einstein's idea. It is, of course, clearly assumed that neither Hume nor Mach had a very clear idea of relativity of space-time but their "concept" could have influenced the entire doctrine incredibly. Norton says, '[t]hat view of concepts enable Einstein to abandon the notion of absolute simultaneity when he finally realized that this notion was all that obstructed his conforming of Maxwell's electrodynamics to the principle of relativity. He replaced it by a new notion of simultaneity introduced through a definition that did not commit to the absoluteness of simultaneity.'[40]Newton's absolutism of space and time, in fact, were constructed on the idea of *a priori* principle. Fixed idea of space is fundamentally built upon Euclidian geometry. In contrast, Einstein rejects those ideas in order to correlate it with the non-Euclidian geometry. He writes, 'for the present we shall assume the "truth" of geometrical propositions, then at a later stage (in the general theory of relativity) we

[37]Φuniv. = GMuniv./ R= C^2. Here, Φuniv. is cosmic gravitational tension, G is the gravitational constant, M is total mass of matter within the curvature, R is the absolute distance. In his article *Einstein's Special Theory of Relativity and Mach's Principle Lars* Wahlin explainsthat there is a close relation between Einstein's theory of Special Relativity and Mach's principle. This essay was presented on February 14, 2002 at annual meeting in Boston, USA.

[38] Albert Einstein, *Autobiographical Notes*, P.A Schlipp trans. and ed., La Salle and Chicago: Open Court, 1979, , 1949, p. 51, Reprinted from P. A. Schlipp, ed., *Albert Einstein: Philosopher-Scientist,* Evanston, IL, Library of Living Philosophers,

[39] In a letter to Moritz Schlick on 14 December, 1915 Einstein writes: 'your exposition is also quite right that positivism suggested rel. theory, without requiring it. Also you have correctly seen that this line of thought was of great influence on my efforts and indeed E. Mach and still much more Hume whose treatise on understanding I studied with eagerness and admiration shortly before finding relativity theory.'; *Papers*, A Vol. 8 A Doc. 165

[40] John D. Norton, "How Hume and Mach Helped Einstein Find Special Relativity", Open court, 2005, p. 26.

shall see that "truth" is limited and we shall consider the extent of its limitation.'[41]Now, let's consider, how this new ideas were taken by the positivists as their operating tools.

What understanding makes the idea to be relative or, in a sense, revolutionary? What is the actual relationship between this new idea and what we call 'experience-fastened theories'? It needs to have a proper understanding to relate these two issues. For our present purpose, we need to go for some practicalities in order to explain these ideas more precisely. Euclidian postulates were very nicely posited in our traditional geometrical books. According to the Euclidian geometry, everything in the world is rather fixed and absolute without having any relation to others. Euclid is always excellent and his excellence pervades through ages. Moreover, what Euclid imagines about his experimental field is non-curvature and non-relative. Suppose, the shortest distance between two points is straight line, or the sum of the angles of a triangle is 180°; are the postulates which make no difference within his proposed framework. But he fails to imagine the situation what practically happens if the surface is imagined to be curvature? Einstein keenly observes that space-time is curved and all motions are curved also. It follows that nothing can be stood in isolation apart from experience. So, experience plays the most vital role in postulating physical theory. Newtonian mechanics is principally characterized by *a priori* thoughts in which experience is always defied. Machian stand is clearly authenticated by the theory of relativity on two grounds: first, relativity theory is based on experiment, second; all scientific theories are an abstraction of facts. Finally, 'he did deny the applicability of physical science beyond the actual facts at hand, this being the foundation of his critique of Newton's ideas of absolute space and time.'[42]

It is often criticized by the anti-Machian that Mach was a pure inductivist and a pure phenomenalist. This criticism was strongly addressed by Rudolf Haller. He argues that this criticism is unfounded and rather non-factual. He writes,

> 'without any ambiguity Mach stressed again and again the intervention of the principle of economy in the process of ordering experience; translated, this means the intervention of rational operations in sensual experience. Therefore, Mach did not recognize the priority of observation to theory, nor that of the subjective to the objective standpoint. So Mach shares with the French

[41] Einstein, *Relativity*, pp. 6.7.

[42] John D. Norton, "How Hume and Mach Helped Einstein Find Special Relativity", Open Court, 2005, p. 26.

> conventionalist the point of view that our experiences are not only ordered according to theoretical criteria, but that the invoked ideal of unique determination is afforded only by decisions which we make in the delimitation of the products of our imagination and in simplifications in general.[43]

Now, have a glimpse on the profile of some influential members:

[43]Rudolf Haller, in *Reconsidering the Forgotten Vienna Circle*.p.98.

Leading member of first Vienna Circle (1907-1912)

S/L	Name	Country	Discipline	Contribution	Adherence
1	Hans Hahn(1879-1934)	Austria	Mathematics, Philosophy [Habilitation, Privatdozent]	Hahn-Banach theorem, Uniform boundedness principle	1905-1914
2	Philipp Frank(1884-1966)	Austria	Philosophy, Logic	Theoretical physics	1907
3	Otto Neurath(1882-1945)	Austria	Philosophy of science, Sociology	Construction of universal system, rejection of metaphysics	1907-1930s [also an active member of 2nd Vienna]

Second Vienna Circle (1922-1950)

S/L	Name	Country	Discipline	Contribution	Adherence
1	Moritz Schlick (1882-1936)	Germany	Physics, Philosophy of science, Mathematics	Philosophical foundation of Relativity theory, space-time, epistemology,	1922-1936
2	Rudolf Carnap(1891-1970)	Germany	Philosophy of science, Logic, Epistemology, Linguistic problem.	Reduction theory, Physicalism, Phenomenalism, Semantics, etc.	1920s--1950s
3	A.J. Ayer(1910-1989)	England	Philosophy of science, Epistemology, Ethics, etc.	Logical empiricism, Verification theory, Emotivism theory.	1930s-1950s
4	Herbert Feigl(1902-1988)	Czech Republic[Austrian philosopher]	Physics, Philosophy	Role of probability and Inductive theory	1920s-1930s
5	Philipp Frank(1884-1966)	Austria	Philosophy, Logic	Theoretical physics	1907 onwards
6	Victor Kraft(1880-1975)	Austria	Philosophy, History, Geography	Non-sensualist empiricism with hypothetical deductive structure	1920s-1940s

Second Vienna Circle (1922-1950)

S/L	Name	Country	Discipline	Contribution	Adherence
7	Gustav Bergmann(1906-1987)	Austria	Mathematics, Philosophy, Psychology	Analytic philosophy, rejection of Metaphysics	1930s -1940s
8	Otto Neurath(1882-1945)	Austria	Philosophy of science, Sociology	Construction of universal system, rejection of metaphysics	1907- 1930s [also an active member of 2nd Vienna]
9	Theodor Radacovic (1895-1938)	Austria	Mathematics	Mathematical theories	1920s-1930s
10	Friedrich Waismann(1896-1959)	Austria	Mathematics, Physics, Philosophy	Concept of linguistic open texture, Porosity, (student of M. Schlick)	1930s
11	Rose Rand(1903-1980)	Ukraine	Austrian-American logician, epistemology,	Philosophical correspondences with Otto, Wittgenstein, Traski are	1930-1935

Berlin Circle

S/L	Name	Country	Discipline	Contribution	Adherence
1	Hans Reichenbach(1891-1953)	Germany	Physics, Mathematics, philosophy,	Theory of probability, Space-time, theory of Relativity.	1920s-1930s
2	Carl G. Hempel(1905-1997)	Germany	Mathematics, Physics, Philosophy of science	General laws in history, scientific explanation, logic of functional analysis.	1920s-1950s.
3	Walter Dubislav(1895-1937)	Germany	Logic, Philosophy of science	Logical and mechanistic foundation of mathematics and physics.	1920s-1930s
4	Kurt Grilling (1886-1942)	Germany	Logic, philosophy	Arithmetic and Axiomatic set theory	1920s -1930s
5	David Hilbert(1862-1943)	Germany	Mathematics	Gordon's problem, Axiomatization of Geometry	1920s-1940s
6	Richard Von Mises(1883-1953)	Lemberg(Austria-Hungery)	Scientist, mathematics	Solid mechanics, fluid mechanics, probability theory.	1920s-1930s

As we have noticed in the above chart, Hans Reichenbach was a full-fledged physicist who dedicated his efforts for philosophical analysis of scientific theories. Throughout 1920s he has written half a dozen books on scientific philosophy. *The Concept of Probability for the mathematical Representation of Reality* (1916), *The Theory of Relativity and A Priori Knowledge* (1920), *Axiomatization of the Theory of Relativity* (1924), *From Copernicus to Einstein* (1927), *The Philosophy of Space and Time*(1928). Following those books he wrote some other books on probability and Relativity theory. He had a long good associations with Einstein, Ernst Cassirer (Neo-Kantian Philosopher), David Hilbert, and Max Plank, Max Born (both were very influential physicists).

Reichenbach introduces an important idea for physical theory which differs from mathematical theory. This is coordinate definition. Physical theory uses coordinate definition. 'A scientific theory requires a physical interpretation only by means of coordinate definition. Without such type of a theory lacks of a physical interpretation and it is not verifiable, but it is an abstract formal system, whose only requirement is axioms' consistency'[44]

According to Reichenbach, in geometry, it uses two kinds of theories: mathematical geometry, and physical geometry. Mathematical geometry explores consequence of axioms, because it does not deal with truth of axiom. On the contrary, physical geometry deals with the problem of physical world related to space. It justifies the truth or falsity of axioms by using the methods of empirical science. Finally, physical geometry derives from the mathematical geometry when appropriate coordinative definitions are added.'[45]Kantian's "space" is falsified by Reichanbach on the assumption that *a priori* character of Euclidian geometry does not fit with actual nature of the world. He concludes that on the surface of the sphere the ratio between circumference of a circle and its diameter is less than π(3.1415926…), whereas on the plane surface it is equal to π. Furthermore, in *The Philosophy of Space and Time* he explains, how Euclidian geometry is inadequate in terms of further development of non-Euclidean geometry by Gauss, Riemannian and others. Mathematical geometry and physical geometry, thus, are different in nature where mathematical geometry deals only with abstract structure but physical geometry speak nothing about abstractness. 'Physical geometry describes the structure of physical space; it is a part of physics. The

[44]Mauro Murzi, *Encyclopedia of Philosophy,* 2nd edition, Macmillian References, USA, 2006.
[45]*ibid.*

validity of its statements is to be established empirically –as it has to be in any other part of physics –after rules for measuring the magnitudes involved, especially length have been stated'.[46]

1.3 Political and Cultural Background

It must be recalled that logical empiricism was formally dissolved and shattered as a philosophical doctrine not only for its methodological standpoint but also for its political and cultural views that emerged as a revolutionary approaches. 'Most of the logical empiricists had relatively progressive in politics. A few, notably Otto Neurath were avowed Marxists. Others, including Rudolf Carnap and Hans Hahn, were socialists.'[47]

Friedman announces that, 'logical positivism also was actively involved with the revolutionary socio cultural and political struggles of the period and, in particular, with the movement for a *neue Sachlichkeit* in both society and the arts typified by the Dessau Bauhaus.'[48]Friedrich Stadler examines thoroughly its social background along with political connections in his important essay, Aspect of the Social Background and Position of the Vienna Circle at the University of Vienna[49]. Stadler attempts 'to establish certain basic facts with a historical re-presentation or reconstruction of the Vienna Circle as a philosophical movement and world-view must take of if it is proceeded according to the principles and methods of an 'externalistic' history of culture and ideas.'[50] Before the circles' activities at Vienna no significant dominance by anti-metaphysical currents were noticed significantly. Rather, 'adherents of such different currents e.g., German Idealism (in particular neo-Kantianism, Herbartianism), of natural law scholasticism, of Christian world-view, philosophy

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[46] Hans Reichenbach, *The Philosophy of Space and Time*, Dover Publications, USA, 1958, p.6; In making a difference with Kant Reichenach says, "In Kantian terminology, mathematical geometry holds indeed *a priori* as Kant asserted , but only because it is analytic. Physical geometry is synthetic; but it is based on experience and hence does not hold *a priori.* In neither of the two branches of science which are called "geometry" do synthetic judgments *a priori* occur. Thus Kant's doctrine must be abandoned."

[47] S Sarkar, ,(ed.), *The Emergence of Logical Empiricism: From 1900 to the Vienna Circle*, A Graland Series in Readings in Philosophy, Harvard University, 1996, pp. viii, ix.

[48] Michael Friedman, *Reconsidering Logical Positivism*, Cambridge University Press, 1999, preface

[49] Thomas E. Uebel, (ed.) *Reconsidering the Forgotten Vienna Circle Austrian Studies on Otto Neurath and The Vienna Circle,* Kluwer Academic Publishers, Dordrecht/ Boston/ London, 1991, p.55.

[50] *ibid.,* p.51.

(*weltanschauungsphilosophie*) of neo-romantic universalism were active there.[51]Very small sections among them were inspired by logic, mathematics and linguistic philosophy of Frege, Russell and Whitehead. The socio-political polarization of Vienna was importantly noticed by Stadler. It became 'two-camps': scientific philosophy and the conservative fascism. The former was dominated by democratic tendencies and the later by anti-democratic attitudes or particularly, neo-romantic conservatism and fascist totalitarian axis.[52]

Statistics shows, the member of Vienna Circle were from different disciplines and their interests were multifarious ranging from Plato to Mach. The philosophers to whom specific lectures were dedicated between 1848 and 1938 shows: Kant (50), Schopenhauer (26), Aristotle (20), Plato (17), Nietzsche (16), Mach (4), Boltzman, Einstein, Brentano (2 each).[53]It shows that they discussed about many issues in succession whichever they think it to be important for their purpose. Most importantly it reminds us that, 'The Vienna Circle's anti-speculative logical empiricism and the political profile of its members represented a provocative questioning of every *a priori* legitimation of authority in science and politics.'[54]This is the main root of antagonism in the social and philosophical domain. Stadler finally makes the conclusion with the reference of socio-cultural atmosphere at Vienna:

> Given this overwhelming dominance of the right-wing bourgeois camp, the question arises whether and how these—literally attacked—person reacted other than by an understandable withdrawal or by passive resistance. As mentioned, all leftist groups, all free thinking liberal forces, remained a minority and their politics had almost no effect. This is true of the students as much as of the isolated professors and their teachers in higher education.[55]

Importantly, it is noticed that before the regular activities of Vienna Circle at Vienna; similar program were existed there led by Hans Hahn, Philipp Frank, and Otto Neurath near a decade ago. Their program is characterized by Rudolf Haller as the first Vienna Circle.[56]Haller claims in his essay thatHans Hahn was the first man who started the task around 1907.So, Hahn is the pioneer of the program who is responsible for the

[51]*ibid.,* p. 52.
[52]*ibid.,* p. 53.
[53]*ibid.,* p. 54.
[54]*ibid.,* p. 55.
[55]*ibid*.,p.69.
[56]Rudolf Haller, "The First Vienna Circle" is taken from T. E. Uebel (ed.), *Reconsidering the Forgotten Vienna Circle,* Kluwer Academic Publishers, Netherland, 1991, p. 95-108.

initiation. That was also Thursday's discussion program like second Vienna Circle. It is evident that their 'interests were described as essentially methodological and theoretical, but also as promoted by "political, historical, and religious problems"[57]. With an especial reference to Neurath, Haller writes, 'Ernst Mach and the French theorists of science, Pierre Duhem, Henri Poincare, and Abel Rey, were the main authors who formed and influenced the attitude of this group of philosophically interested scientists.[58]

Obviously, there was an important philosophical connectivity between Mach and French conventionalists. Although Duhem's thesis against the verifiability principle had been a thorny issue for the positivists promoted by Quine but this cannot be denied that in positivistic philosophy their contribution had been counted a lot.

1.4 Development of Post-Kantian epistemology

Kant, very confidently, advocated for synthetic *a priori* judgment. He argues, how synthetic judgment can be *a priori.* To make the judgment possible, he says that, all mathematical judgment, without exception, are synthetic[59]and at the same time a *priori.*Suppose, take a proposition like, 5+7=12. It is a proposition which is taken to be synthetic and *a priori*. From our commonsense, we take it to be *a priori* because it never depends on experience. But, the problem arises when we ask: how it can be synthetic? It can be synthetic in a sense that, 5+7 is the subject and 12 is the predicate of the proposition. But, in 5+7 nobody can find 12 so, 12 is an essentially different idea to that of 5+7. In geometry, this case is always same. What happened for natural science? This is the most crucial issue for Kant since the debate over the issue has been procrastinated. Suppose, take two propositions about natural science, 'in all changes of the material world the quantity of matter remains unchanged', 'in all communication of motion, action and reaction must always be equal.'[60] Those are uncontestably taken though they are synthetic. Kant's arguments are very naïve and free from skeptic trend. He unequivocally rests his belief on scientific postulates where he thinks to be certain in all cases. This is the problem for which the logical empiricists are concerned about. Logical empiricists contested against Kant about the judgment of Kant's explanation of synthetic propositions. He develops, 'what he calls a "transcendental" philosophy of our human cognitive faculties –in terms of "forms of sensible intuition" and "pure concepts"

[57] ibid, pp. 96,97.
[58] *ibid.,*p.97.
[59] Kant, *Critique of Pure Reason*, Macmillan St. Martin Press, 1970, p.52.
[60] *ibid.,* p. 54

or "categories" of rational thoughts. These cognitive structure are taken to describe a fixed and absolutely universal rationality—common to all human beings at all times and in all places –and thereby to explain the sense in which mathematical natural science (the mathematical physics of Newton) represent a model or exemplar of such rationality.'[61]It is a commonly accepted view that in present science Kantian thesis has been given up. Logical empiricists quietly rejected Kant's theorem in a sense that "synthetic" and "a priori" are completely opposed to each other. So, they can never be reconciled. Friedman exposes very clearly about the post-Kantian ideas as thus:

> In the current state of sciences, however, we no longer believe that Kant's specific examples of synthetic a priori knowledge are even true, much less that they are a priori and necessarily true. For the Einsteinian revolution in physics has resulted in both an essentially non-Newtonian conception of space, time and motion in which the Newtonian laws of mechanics are no longer universally valid, and the application to nature of a non-Euclidian geometry of variable curvature , wherein bodies affected only by gravitation follow straightest possible paths or gedodsics. And this has led to a situation, in turn, in which, we are no longer convinced that there are any real examples of scientific a priori knowledge at all. If Euclidian geometry, at one time the very model of rational or a priori knowledge of nature, can be empirically revised, so the argument goes, then everything is in principle empirically revisable. Our reason for adopting one or another system of geometry or mechanics (or, indeed, of mathematics more generally or of logic) are at bottom of the very same kind as the purely empirically considerations that support any other part of our total theory of nature. [62]

1.5 Moore and Russell: foundation of objectivity

In British empirical traditions, Russell and Moore, the most striking duo of Cambridge philosophy has had a great stir in the history of analytical thoughts. The movement which was initiated by these two philosophers created convenient environment for the objective movement. They actually saved the whole Cambridge philosophy from the clasp of Hegelian-Bradlian traditions. Russell, from the beginning of his philosophical career, is concerned about the knowledge of mathematics and geometry in which he

[61] Michael Friedman, "Kant, Kuhn, and the Rationality of Science", in Friedrich Stadler (ed.) *History of Philosophy of Science: New Trends and Perspective,* Kluwer Academic Publishers, 2002, p. 170.
[62] *ibid,* p.172.

explores the indubitable truth. At Cambridge, he studied Kant and Hegel. And once he falls into the philosophical trap of Bradley. Bradley's logic is impressive but that fascination come to an end following the discussion with G.E. Moore. Russell writes, 'Analysis of mathematical propositions persuaded me that they could not be explained as even partial truths unless one admitted pluralism and the reality of relations.'[63] He later concedes, 'I could no longer believe that knowing makes any difference to what is known. Also I found myself driven to pluralism'[64]. This pluralistic thought brings him to Logical atomism. He says, atoms are logical which is in the last resort unanalyzable and thereby it is simple. The world is consists of logical facts, which he calls atoms, is ultimately unbreakable. Facts are composed of different "objects" which is characterized as true and false.

On the other hand, Moore, in his "Refutation of Idealism" rejects Berkeley's famous postulate *esse est percipi* which he thinks to be the chief foundation of Idealism. Berkeley, Moore argues, was in serious misconception while taking the subject of this proposition synonymous to predicate. It can never be guaranteed that the subject *esse* confirm *percipi* or *percipi* in all cases depends on its *esse.*

Russell's philosophy of logical atomism is an inspiring element for the movement. Logical atomism, for Russell, is an especial philosophical tenet that expresses his realism. In this big pluralistic world things can be conceived through the atomic fact that is rather unanalyzable. If we analyze every fact into its smaller unit it comes to be easier to avoid the confusions. In order to make it more conceivable Russell underscores the need to comprehend the business of philosophy. He writes, 'The business of philosophy, as I conceive it, is essentially that of logical analysis, followed by logical synthesis. Philosophy is more concerned than any especial science with relations to different sciences and possible conflict between them; in particular it cannot acquiesce in a conflict between physics and psychology, or between psychology and logic. Philosophy should be comprehensive, and should be bold in suggesting hypotheses as to the universe which science is not yet in a position to confirm or confute.'[65]

Russell is greatly influenced by Moore on the way to the refutation of Idealism. He writes, 'During 1898, various things caused me to abandon both Kant and Hegel. I read Hegel's *Greater Logic*, and thought, as I still do, that all he says about mathematics is

[63]Bertrand Russell, *Logical Atomism,* A. J. Ayer (ed.) Logical *Positivism*, The Free press, Gleneoe, Illinois, 1959, p.32.
[64]*ibid.,* p.3.
[65]*ibid*.

muddle-headed nonsense. I came to disbelief Bradley's argument against relation and to distrust the logic bases of monism. I disliked the subjectivity of the "Transcendental Aesthetic". But these motives would have operated more slowly than they did, but for the influence of G. E. Moore'[66]. Russell, in his autobiographical avowal, writes about Moore, 'He took the lead in rebellion, and I followed, with a sense of emancipation'[67]. Russell is overgenerous in acknowledging his debt to anyone from whom he has borrowed the idea about something.

For the case of his initial stage at Cambridge he does show no mistake to avow his indebtness to G.E Moore and Mc. Taggart who are thought to be the follower of Hegel. Moreover, he acknowledges his more indebtness to others from where he has borrowed the idea from different issues. He writes more,

> '… Lowes Dickinson, whose gentle charm made him loved by all who knew him; Charles Sanger, a brilliant mathematician at College, afterwards a barrister, known in legal circles as the editor of Jarman on Wills; two brothers, Crompton and Theodore Llewelyn Davies, son of a Broad Church clergyman most widely known as one of " Davies and Vaughn," who translated Plato's *Republic*. These two brothers were the youngest and ablest of a family of seven, all remarkably able, they had also a quite unusual capacity of friendship, a deep desire to be of use to the world, and an unrivalled wit. … Somewhat junior to me was G.E Moore, who later had a great influence upon my philosophy.'[68]

This is evident that Moore has influenced Russell in every important turns. Russell is a Hegelian and also a Kantian during the time of philosophizing at the last decade of 19th century. But the whole atmosphere change quickly and he soon abandons Hegelian and Kantian philosophical doctrine. Bradley's argument about the knowledge of objects is very much confusing. He holds that, 'everything commonsense believes in is mere appearance'. Russell on the contrary argues the opposites view. He maintains that, 'we [He and Moore] reverted to the opposite extreme and thought that *everything* is real that common sense, uninfluenced by philosophy or theology, suppose real'.[69]. Russell has defined this fact and terms it as the escape from prison. He further goes, ' with a sense of escaping from prison, we allowed ourselves to think that grass is green, that the sun

[66]B. Russell, *My Mental Development* in *The Philosophy of Bertrand Russell* (ed.), Paul Arthur Schilpp, Srishti Publishers & Distributors, Calcutta, 1998, pp.11-12
[67]*ibid.,* p. 12.
[68]*ibid.,* pp. 9-10.
[69]*ibid.,* p.12.

and stars would exist is no one aware of them, and also there is a pluralistic timeless world of Platonic ideas.'[70] Like all other Idealists, Bradely holds that judgments are about ideas. It does not exist independently of our thoughts. Moore does no longer holds that ideas are mental. It is 'neither a mental fact nor any part of a mental fact'. Moore writes *The Nature of Judgment* in *Mind*(1899) where he maintains the objectivity and the independence of objects of thoughts. Russell in almost same time published *An Analysis of Mathematical Reasoning* where he rejects the Idealistic view. They were concerned about the nature of judgment. They hold that the ultimate constituents of the world are 'concepts' or 'terms'.

What Moore wants to define by using 'concept', Russell defines the same thing by using 'term''. Russell's realistic position is conspicuously exhibited in *The Principle of Mathematics*. He writes, 'words all have meaning, in the simple sense that they are symbols which stand for something other than themselves.'[71] Here, Russell needs to correlate every meaningful word with the reality. Sajahan Miah inquires Russell's realistic position as follows, 'having admitted that every word indicates a term and every term has being, Russell needs an expensive conception of reality. As a result of this a lot of "non-existent" and logically impossible objects (though the latter are rarely mentioned) invaded the Platonic heaven. Since we can conceive of the round of square, the present King of France, the Golden Mountain, etc. they are terms, and since they are terms, they have being.'[72] Russell introduces the theory of description to avoid the need of non-existent entities. He says, every unit of language needs to refer something to be existent or it must correspond some elements of reality. Russell or Moore was not positivists in any sense. Moreover, in many cases, they were very critical against the positivistic trends. However, their positions were against the spirit of Idealism, more especially against metaphysics. I think Moore and Russell, along with Wittgenstein, create an outstanding environment in Cambridge where the free thinkers make the way to construct a new dimension of philosophy. Russell was especially interested in physics and wrote on the theory of relativity. Though he was not a positivist, but what he describes about "fact" and "assertion" is by no means different from that of the message of positivism.

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[70].Bertrand, Russell, *The Principle of Mathematics*, Allen &Unwin, London, 1964, p.47.
[71]Bertrand Russell, *Portraits from Memory*, Allen &Unwin, London, 1956, p.43.
[72]SajahanMiah, "Moore's Influence on Russell: Transition from Idealism to Realism", in *Philosophy and Progress,* Dev. Centre for Philosophical Studies, University of DhakaVol.-xxii-xxiii, June-December, 1997.

Finally, I would say that logical empiricism is a theory of epistemology that has every character of empiricism. However there is a big difference between classical and logical empiricism. The difference with their predecessor are, classical empiricism advicates that there is a world and we receive some data from it where our senses plays the final role. Accordingly, after correspondence with the objects an idea is built up as a picture of the world. Logical empiricism added more with classical definition here with a view that only meaningful statement can be defined according to their statutsof empirically verifiable. So, the very term "logical", here, is important. As a result, statement are accepted as flawless if and only if it is thought to be verifiable.

Let's sum up the introductory note which encompasses our future program. The salient feature of the previous discussions can be singled out in the following way:

- Logical empiricism as a legacy of socio-political outfit of European thoughts has been characterized as the most advanced philosophy of twentieth century. Most part of its origin is ignored in history because of its methodological features. It is looked down only on the view that it damages ethics, morality, religion, and human good senses. But, in most of the cases, these accusations are utterly unfounded. Actually, the litigant against logical empiricism fails to make the difference between "cognitive value", and "emotive value". Logical empiricists never deny having emotive value of those assertions. However, it needs to reappraisal those moves thoroughly. In the later sections, I have tried to reconnect its basic trend with the development of socio-philosophical tenor.

- Very distinctly, it stands and stirs the whole European thoughts for almost three decades.Roughly speaking, its influences are still prominent. For present day, realism, anti-realism, pragmatism, phenomenology, and different kinds of debates come into vogue. Many philosophers in the present day are seriously "reconsidering logical positivism."It arises sometimes in the history when science, physics particularly turns on the century. Theory of relativity and Quantum physics – development of new physics—became compatriot to logical empiricism which, I think, is characterized as the most vital issue for this project. We shall examine this.

- It is evident that from Wittgenstein, a new philosophical tenor started its operation. Schlick writes, '[t]he paths have their origin in logic. Leibniz dimly

saw their beginning. Bertrand Russell and Gottlob Frege have opened up important sketches in the last decades, but Ludwig Wittgenstein is the first to have pushed forward to the decisive turning point.[73]Therefore, in the introductory note I have tried to find out the clue and linkage between Wittgenstein and positivistic thoughts

[73] Moritz Schlick, "The Turning Point of Philosophy" in A.J. Ayer (ed.) *Logical Positivism*, The Free Press, Glenncoe, Illinois, 1959, p.54.

2.

MODERN PHYSICS AND EMPIRICAL PHILOSOPHY

To be sure, modern physics rests upon two fundamental pillars—general relativity and quantum mechanics. It deals with, on the one hand, a theoretical framework to understand this big universe, star, galaxies, clusters of galaxies, nebula, and its immense expanse, and on the other, a theoretical framework to understand on the smallest scale with molecules, atoms, and all the way down to subatomic particles like electron and quarks.[74]These two areas of human thoughts are substantially a high classified understanding of this nature. Very fortunately, this discussion has reached at a point where philosophy takes the responsibility with unbound zeal. In this section I will try to prove that there has been a deep relationship between modern physics and empirical philosophy on the question of understanding nature. In other words, empirical philosophy emerged as a result of the activities of modern science especially the physics of 20th century. Moritz Schlick writes, '[t]here is no longer any doubt nowadays, that theoretical philosophy has standing only in close connection with the sciences, whether it seeks in them a basis on which it attempts to build further, or whether they form for it merely the subject-matter of its own analyses, whereby it then makes individual inquiry into the first principles of knowledge.'[75] In addition, this philosophy has emerged at a time when other branch of science, biology for example, has had a new turn in the course. In the introduction to *The Emergence of Logical Empiricism: From 1900 to the Vienna* Circle, Sahotra Sarkar writes,

> The early years of twentieth century saw remarkable developments in the sciences particularly physics and biology. The century begin with Plank's introduction of what came to be known as the "quantum hypothesis", followed by the work of Einstein, Bohr, and others, which paved the way for the development of quantum mechanics in the 1920s. It remains the most radical departure from the classical world view that physics has seen. Not only were some physical quantities "quantized", that is, they could only have discrete values, but there were situations in which some of these values were

[74] Brian Greene, *The Elegant Universe*, Vintage Books, N.Y. 2000, p. 3.
[75]Moritz Schlick, "Epistemology and Modern Physics", 1925.

> indeterminate. Perhaps even worse, the basic dynamics of physical system was indeterministic. The mechanical picture of the world, inherited from the seventeenth century, and already under attack during nineteenth, finally collapsed beyond hope of recovery. Nevertheless the new physics was unavoidable. Not only did atomic phenomena abide by its rules, but it provided a successful account of chemical bonding and valiancy. Meanwhile, in 1905, Einstein's special theory of relativity challenged classical notions of space and time. A decade later, general relativity replaced gravitations a force by the curvature of space-time. Developments in astrophysics confirmed general relativity's unusual claims.[76]

It clearly proves that logical empiricism as a philosophical doctrine is essentially very close to the idea of modern physics. Here, modern physics denotes with the fact that no physical laws can stand apart from human experience or regulation of human observations. My aim is, thus, to show that there has been an essential nexus with two important developments of physics – relativity theory and Quantum mechanics. Further, it is taken into consideration that philosophically there was a considerable gap between classical physics and modern ideas of relativistic theory. Now, turn to the history of old physics.

2.1 Traditional ideas of classical physics

Old or classical physics basically rests upon the idea of absolute space, time and motion of Isaac Newton (1642--1727). In philosophy, these ideas have had a great influence on later philosophical theories. Most part of epistemological functions are clearly demonstrated on the basis of Newtonian mechanics. Newton believes that "space" is completely distinct from body, whereupon, "time" incessantly passes through independently of any perceiver. This is called absolute space and time. By absolute, Newton understands that which does not depend upon any external factor. According to his own definition, '[a]bsolute space, in its own nature, without relation to anything external, remains always similar and immovable.'[77] And, for absolute time, '… from its own nature, flows equably without relation to anything external,.'[78]Newton further says,

[76]SahortaSarkar (ed.), *The Emergence of Logical Empiricism: From 1900 to the Vienna*, A Garland Series in Readings in Philosophy, Robert Nozick , Harvard university, 1996, p. *vii*
[77]Issac Newton, "Absolute Space and Time" in Paul Edwards, (ed.) *Problems of Space and Time*, Macmillan Company,N.Y. 1964, p. 81.
[78]*ibid.*

'[a]bsolute motion is the translation of a body from one absolute place into another.'[79]According to Newton, space is essentially absolute, independent, infinite, three-dimensional, eternally fixed, uniform 'container' into which God 'placed' the material universe at the moment of creation.[80] On the other hand, time is an absolute, independent, infinite, one-dimensional, fixed, uniform 'framework'.[81]Newton proves his ideas regarding the absolutism of space and time in the *Principia.* His 'rotating bucket'[82] and 'two globes'[83]experiments finally show that space is absolute. It is said that Karl Friedrich Gauss(1777-1885)has proved Euclidian prediction of the sum of a triangle by taking three points (Brocken, Hohenhagen, and Inselberg) which were a good distant with each other. (Einstein's Space-Time: An Introduction to Special and General Relativity Rafael Ferraro).

Newton's ideas of space and time, and motion as well were based on traditional world views. Space among it is constructed thereupon on Euclidian postulates. A.P French writes, 'our physical measurements agree with the theorems of Euclidian geometry, and

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[79]*ibid.*
[80] Christopher Ray, *Time, Space and Philosophy*, London and N.Y, 1991, p. 99.
[81]*ibid.*
[82] Bucket-experiment is a thought-experiment which is devised by Newton to prove absolute space. A water containing bucket is rotated in an otherwise empty space. As the water in the bucket starts to join the bucket's rotation, it slowly creeps towards the rim of the bucket. Newton, then, comes to the conclusion that this phenomena is due to the water's 'inertia' relative to absolute space.' For detail, FeddeBenedictus, *Logical Positivism &The Theory of Relativity*, Dieks Institute for History and Philosophy of Science, Utrecht, 2009, p. 12.
[83] In the Scholium Newton places his argument which I will quote from Christopher Ray's *Time, Space and Philosophy*:[I) our general experience leads us to link occurrences of inertial forces with accelerations such as rotations. So we might argue that any rotating system experiences inertial forces as consequences of its rotation; for example a system of two globes connected by a cord rotating about a common center would experience a tension force along the cord. 2) With a system like the two globes and cord there are two possible situations: either there is a tension in the cord or there is no tension. 3) In both cases the relative position of the globes and cord are always the same. 4) So, if we restrict our attention to the system itself, then the only way we might tell that it is rotating (or accelerating in some other way) is by checking for tension in the cord. 5) we might suppose that we can always check for rotation by looking for relative motion between the system and some back ground frame of reference like the fixed stars. 6) But we can easily imagine the system in an otherwise empty space—in an immense void, as Newton Calls it. 7) in this case, we are unable to rely on a material background frame of reference. But we can still be sure whether or not the system is accelerating by checking for signs of tension in the cord. 8) If there is tension then we can justifiably say that the system is accelerating 'absolutely' with respect to space itself. 9) And in such a case the source of the inertial forces must lie in some 'internal' interaction between accelerating system and space. 10) Therefore, we cannot explain the presence of inertial forces without an essential reference to space itself. In this sense, space may be said to be absolute—it is an irreducible element in our physical description of matter and forces.], p.101.102
About time he argues, ['inertial forces in the globe system indicate: that there really is a rotation; and, therefore, that the velocity of each globe is continuously changing, because velocity depends on direction as well as speed. The changes in direction and therefore in velocity are changes in time. But in an otherwise empty space there is no changing material framework to which this change may be referred. So the change is relative to a non-material temporal structure: namely, absolute time.], p.102.

space is thus assumed to be Euclidian.'[84]But, when Euclid's limitations were proved through practicality, particularly on the surface of curvature, Newton's space and time absolutism became in a serious threat in spite of 'having proved to be highly successful'. It follows that Newton's idea about the physical world is completely mechanical. Therefore, according to the mechanical rules, 'material bodies which consist of tiny corpuscles interact with one another in a vast spatial container.'[85] Newton's position about the matter is philosophically very close to the theory of Robert Boyle and John Locke.[86] Newton's mechanics was rather dominating in physics until nineteenth century. At the outset of 20th century this was collapsed. Before that, Leibniz first attacked his absolute space. As a metaphysician his argument was quite different and something obscure. He divides the world as 'world of appearance' and 'world of reality' where our senses only have the access to the appearance but not reality. He finally rejects our senses 'although our senses seem to tell us that the world consists of material objects occupying space and persisting through time, … we have no reason to trust our perception.'[87]It is very unclear, according to him, how he makes the difference between 'realm of monads' and 'physical world'. However, it is assumed that absolute and independent status of space and time have been characterized and authenticated from his so-called ideas of 'monadic realm.' Further, Newton's space and time had been seriously debated between Clarke and Leibniz because Clarke was a pro-Newtonian. Newton's physics could not face at least two challenges from the later critics. First, it completely ignores our experience, practical geometry which appears to be the geometry of Riemannian et al and second it does not adequately address the motion of the *body* moving fast at the speed of light.

Friedman explains this new ideas of modern thoughts in this way, 'For the revolutionary new developments in the mathematical foundation of geometry and, even more, the application of many of these new mathematical ideas to nature in Einstein's theory of relativity seemed to suggest irresistibly that all earlier attempts to comprehend philosophically the relationship between geometry on the one hand and our experience of nature on the other were radically mistaken'[88] What is the basic point that make the difference between the old theorem and its contradiction with our experience? Why does Friedman propose the old idea as 'radically mistaken'?

[84] A.P. French, *Newtonian Mechanics*, Massachusetts Institute of Technology,1971, p.44.
[85]*ibid,* pp. 103-104.
[86]*ibid*, p. 104.
[87]*ibid,* p. 105.
[88]Michaeel Friedman, *Reconsidering Logical Positivism,* p.44.

2.2 Post-Newtonian development

This is historically proved that Hume and Mach had influenced Einstein very significantly. Hume is more influential than Mach which Einstein concedes himself during correspondence with Schlick[89] which is concerned with the philosophical interpretation of relativity theory. Einstein writes it to Schlick that, shortly before his relativity theory he studied Hume's *Treatise.*[90]It is clearly predicted from Hume's discourses why does Einstein make this confession[91]about Hume's writings. Hume agrees with the fact that all concepts are grounded in sense impressions. This is the very position of an empiricist. We now turn to Mach who is believed to be responsible for positivistic persuasions.

2.2(a) Mach and his positivism

Mach was a first-rate physicist[92] and most influential philosopher of science at the turn of 20th century. He was an anti-realist and at the same time his strong inclination to the positivistic persuasions was noteworthy. It is also important to note that he was a monist and naturalist. The center of his monism and naturalism develops with a belief that nothing lies beyond the phenomena. Mach's entire philosophy has two important significances: a) it establishes the 'crude' empiricism that advocates for such knowledge which directly invokes sense-experience; b) it is an attempt to understand the world in a very simplistic way which finds that science can never proceed with unobservable facts

[89]Einstein writes in a letter to Schlick, your exposition is quite right that positivism suggested rel. theory, without requiring it. Also you have correctly seen that this line of thought was of great influence on my efforts and indeed E. Mach and still much more. Hume, whose treatise of understanding I studied with eagerness and admiration shortly before finding relativity theory.' Moritz Schlick, *Philosophical Papers,* A. vol. 8A, Doc. 165(December 14, 1915).

[90] John D. Norton in his article "How Hume and Mach helped Einstein find Special Relativity" finds that first part of Hume's Treatise of Human Nature was available in German edition and Einstein was provoked to read the book. Einstein had a small reading group "Olympia Group" which was founded by his friend ConardHabicht and Maurice Solovine in 1902. P.20

[91]He has also acknowledged his debt towards Mach along with Hume. He put his acknowledgement in this way: 'Today everyone knows, of course, that all attempts to clarify this paradox [of light that leads to special relativity] satisfactorily were condemned to failure as long as the axiom of the absolute character of time, or of simultaneity was rooted unrecognized in the unconscious. To recognize clearly this axiom and its arbitrary character already implies the essentials of the problem. The type of critical reasoning required or the discovery of this central point was decisively furthered, in my case, especially by the reading of David Hume's and Ernst Mach's philosophical writing's. Albert Einstein Autobiographical Notes, P.A Schlipp, transl. and ed. La Salle and Chaigo, Open Court, 1979, p.52. Reprinted and corrected from P.A. Schlpp ed., *Albert Einstein: Philosophers-Scientist*, Evanston, IL, Library of Living Philosophers.

[92]Ayer, *Freedom and Morality and Other Essays*, Clarendon Press, Oxford, 1984, p.162.

or entities. He didn't believe in any unobservable entities. For that, he didn't believe in the existence of atom in a belief that 'atom cannot be observed'. This very simple and naïve proclamation was seriously rebutted by his successors particularly Ludwig Boltzmann.

Machian physics was wholly influential during his time especially in Austria because most of the logical empiricists were exploring such interpretation of physics which come very close to positivistic leanings. Mach stands against Newton about the interpretation of space and time. He rejects absolute motion of body in favor of relative motion on the basis of this logic that velocity and acceleration are not meaningful without any reference point. He proposed that fixed stars could be taken as the universal reference for motion of body. Another important significance of these ideas was critically reflected in the general theory of relativity of Einstein. "Mach's Principle" proposes that 'the inertial system should not be conceived of as determined by absolute space, but by totality of masses in the universe. [93]

We will discuss this point in the later section. Machian philosophy was very close to William James. It is strongly believed that Russell's idea of "Neutral Monism" was a philosophical succession of Mach and James's monistic philosophy. Ayer notes that, 'its basic tenet is that neither mind nor matter is part of what Russell called the ultimate furniture of the world. Both are constructions out of neutral stuff—the raw material of experience most often simply called experience by James, sensation by Mach, sensibilia by Russell.[94]

2.2(b) Reductionism

Mach became famous to the scientist for his reductionism. His reductionist view has mixed reactions among the physicists as well as philosophers of science. Carnap's reductionism is basically a developed form of Machian reductionist view which was very much criticized by Quine. We will keep aside this issue for a while. Now, what Mach says about scientific activities is very simple. No scientific theorem can be accepted finally if it does not refer to our senses. So, sense-experience ultimately allows the entry permission of meaningful scientific thoughts. This is the position of logical empiricists through which they are entitled to justify meaningful statements. His

[93]FeddeBenedictus, *Logical Positivism &The Theory of Relativity*, Dieks Institute for History and Philosophy of Science, Utrecht, 2009. P. 12.
[94] Ayer, *Freedom and Morality and Other Essays*, Clarendon Press, Oxford, 1984,p.160.

phenomenalistic philosophy is clearly exhibited in almost all writings. He developed a detail account of the role of economy in science.[95]He believes that scientists should be economical on the ground that they should regard the content of their descriptions.[96] He suggests minimizing its epistemological commitments[97]. Further, he advises the scientists not to waste their time with unnecessary objects. They should economize as much as possible on their time and their efforts.[98] This is very clear that Mach wants the scientists to be economical because he believes that science should not deal with non-science. Difference between science and non-science is possibly marked here as "philosophy" and 'metaphysics". So, the intention of Mach is very similar to that of the positivists. Many scientists thank him for his phenomenal approach because it is the basic character of science which is believed to deal only with the "real" properties.

Mach explains the so-called demarcation between "appearance" and "reality" in a sense that this division is only a terminological complication of a same object. Otherwise, it signifies nothing. He denies any difference between appearance and the so-called reality. He writes, 'thing, body, matter, are nothing apart from their so called attributes.[99] It actually arises out of misinterpretation of facts. To be sure, Mach'semphasis on grasping the frame of reference from a fact is judged. For example, a straight stick is looked crooked when it is dipped into the water. Do you believe that the stick is really crooked? No. We don't believe in such result because we consider the 'frame" from where we are going to check it out. We consider the condition of the stick along with the observer's position and place. Further he writes, ' to be sure, our expectation is deceived when, not paying sufficient conditions, and for substituting for one another different cases of the combination we fall into the natural error of expecting what we are accustomed to, although the case may be an unusual one.[100]Mach uses the term "practical meaning" and "scientific meaning" in order to distinguish appearance and reality. Finally, he wants to avoid the controversies between "real" and "unreal" which, he believes, possess nothing. Suppose, two situations like dreaming and waking are quite different to each other for only their frame of reference. For waking 'the relations of the elements to one another are immensely amplified' but for dreaming,

[95] Christopher Ray, *Time, Space and Philosophy*, p. 120.
[96]*ibid,.*
[97]*ibid*,
[98]*ibid,*
[99] Ernst Mach, *The Analysis of Sensations,* pp. 6-7.
[100]*ibid.,*p.11.

psychic visions are narrowly downed. He rules out the proposed difference and criticized Plato for his 'unfortunate ideas.'[101]

Now, we can summarize Machian positivistic philosophy in this way:

i) Mach proposes to consider space and time *relative* as opposed to Newton. He does not accept absolutism of space, time and motion which was virtually the cornerstone of classical mechanics. The most successful attempt to negate Newton's interpretation of his bucket experiment has found in Machian thoughts. Mach proves that Newton is mistaken in attaching his thoughts with absolutism. He 'was probably the first to point at dragging effects in the vicinity of rotating masses when he noted that the bucket experiment only implies that the rotation of the water relative to the vessel does not induce any noticeable centrifugal forces. … Mach insists that absolute motion and absolute space i.e. motion and space in them, resides only in our minds and cannot be revealed by experience, hence they are meaningless idle metaphysical concepts.'[102] From this context, Mach's empirical thoughts can simply be characterized as the 'chief instigator of scientific positivism'.

ii) Mach's chief target was to make clear obscurities and haziness from scientific knowledge. In order to purge off metaphysical absurdities and philosophical opaque, he emphasizes on the organization of thoughts, which he terms as 'economy'. Many physicists may have been excited by the position of Mach because of his rigid phenomenalistic philosophy. Scientists, in many cases, may be enthusiastic towards these rigorous expressions because they only hold that there is no other function of science except dealing with physical objects. However, he had to face serious challenges soon after his retirement from Vienna University.

iii) Mach stands against realism as other empiricists do. So, there is obviously a paradox between his empiricism and realism. Realism announces the

[101]Plato describes human limitations about knowledge which is nothing but illusory and incomplete. He has mentioned an interesting story narrated by Socrates to Glaucon. Human being are chained and tied up with a rope in a cave from their childhood so they are not allowed to see through behind the cave from where people are actually moving around. The moral of the story is: we are only living in a shadow or unreal world. When we will be freed from the cave we will come to know the truth.
[102]Herbert Lichtenegger and Bahram Mashhoon "Mach's Principle" p.5.

independence of object apart from mind empiricism on the other hand does not allow any existence apart from mind. Mach ultimately fails to address the gap.

iv) From Mach, it is supposed to be taken the characteristics of science as: a) science is unified; b) scientific knowledge is indubitable; c) science registers its success through prediction, explanation, and control; d) all scientific knowledge can be reduced to sense-experience or observation is epistemologically immaculate; and finally, e) science is only a branch of human knowledge that can be trusted fully for its objectivity.

Mach's positivistic views are challenged by the philosophers. Even, modern science does not very clearly demarcate theory and observation. The question becomes prominent: how can scientific theories be constructed? Or, isn't there a considerable gap between observation and theory? Now, come to the very crucial issue in science—observable and non-observable entities. In science, many issues are debated for long in which this question is still unresolved. In philosophy of science, the issue between "observable" and "non-observable" has been critically debated among the philosophers as well as the scientists. But, philosophers and scientists are not very much agreed with the issue. In science, the term "observable" is much wider than philosophical usages. On the contrary, in philosophy, this is used in a very narrower sense. Suppose, 'a philosopher would not consider a temperature of, perhaps, 80° centigrade or a weight of 93 pounds, an observable because there is no direct sensory perception of such magnitudes.'[103] To a physicist, 'both are observables because they can be measured in an extremely simple way. The object to be weighed is placed on a balance scale. The temperature is measured with a thermometer. The physicist would not say that the mass of a molecule, let alone the mass of an electron, is something observable, because here the procedures of measurement are much more complicated and indirect. But magnitudes that can be established by relatively simple procedures–length with a ruler, time with a clock, or frequency of light waves with a spectrometer–are called observables.'[104]However, this case is not settled yet. Mach claims that 'observation

[103]Carnap, *Philosophical Foundation of Physics, An Introduction to the philosophy of Science*, Chap. p. (ed.) M. Gardner. New York: Basic Books. Reprinted as *An Introduction to the Philosophy of Science,* 1974.
[104]*ibid.*.

statements are theory-laden or theory-independent.'[105]Again, he believes that observation is epistemologically pure[106]. This simplicity blurred his views for at least two reasons: i) scientific theories are so often constructed without hard and fast rules, ii) many scientific entities are substantially *unobservable* though they have the reality.

In a defense to such attacks, Carnap was very much ready to reply those attackers. He has divided scientific laws –empirical laws, and theoretical laws-- in order to explain observed facts or predicting future observable events and assuming behavior of micro particles. For empirical laws, Carnap holds, 'are laws containing terms either directly observable by the senses or measurable by relatively simple techniques. Sometimes such laws are called empirical generalizations, as a reminder that they have been obtained by generalizing results found by observations and measurements.'[107] Theoretical laws on the other hand, 'do not refer to observables even when the physicist's wide meaning for what can be observed is adopted. They are laws about such entities as molecules, atoms, electrons, protons, electromagnetic fields, and others that cannot be measured in simple, direct ways.'[108] Carnap believes that, in physics, these two types of laws have been incorporated for tracing back the physical world. He writes,

> Sometimes a physicist will distinguish between observables and non-observables in just this way. If the magnitude remains the same within large enough spatial distances, or large enough time intervals, so that an apparatus can be applied for a direct measurement of the magnitude, it is called a macro-event. If the magnitude changes within such extremely small intervals of space and time that it cannot be directly measured by simple apparatus, it is a micro-event. (Earlier authors used the terms "microscopic" and "macroscopic," but today many authors have shortened these terms to "micro" and "macro.") A micro-process is simply a process involving extremely small intervals of space and time. For example, the oscillation of an electromagnetic wave of visible light is a micro-process. No instrument can directly measure how its intensity varies. The distinction between macro and micro-concepts is sometimes taken to be parallel to observable and non-observable. It is not exactly the same, but it is roughly so. Theoretical laws concern non-observables, and very often

[105]Cristopher Ray, p.124.
[106]*ibid*,
[107]Carnap, *Philosophical Foundation of Physics, An Introduction to the philosophy of Science*, Chap. P. (ed.)
[108]*ibid*.

> these are micro-processes. If so, the laws are sometimes called micro-laws. I use the term "theoretical laws" in a wider sense than this, to include all those laws that contain non-observables, regardless of whether they are micro-concepts or macro-concepts.[109]

In modern time, physics advanced with so many equipment that scientist' observational magnitudes expended largely than ever. Nobody now believes that nothing remains to be untraced by the scientists whatever their process-- macro or micro is. So, once there is confusion among the philosophers of science, I believe, that theoretical laws can only be applied to the abstract particles since it deals with only non-observable entities. But, the term "observable" now has been expended remarkably at a stage that it does not confine finally within human unaided senses only. To be sure, it is extended in a way that surpassed its parochial periphery i.e. five sense organs. Now, if this is asked, does this piece of wire contain electricity? Or, how can you measure potential difference between two edges of a conductor[110]? Or, is this drop of water contains bacteria? How do we actually believe about the existence of non-sensible entities? According to the so-called theoretical laws, this can be measured only in a view that this is possible through microscopic devices. To be sure, people do not now believe that "observation" should only be referred to our unaided senses. Truly, doctor immediately suggests his patient to diagnose the problem before suggesting. Why does he do that before suggestions? He actually wants to be confirmed the problem which is virtually not understandable before "real" detection. Accordingly, he suggests for "further observations" which is usually finished by medical equipment. It is now established beyond suspicion that observation means anything that is tested by unaided or aided senses. The "star" is looked very small from a distance even though it is not small, but, when we observe it through telescope it appears to be big if not big as it is. However, scientists could able to figure out its exact size through another observation. So, the division of physical laws conclusively exposes the same events of physical bodies.

What is the thing that makes a philosopher empiricist? Alternatively, how can a philosopher be an empiricist? Fundamental point of this issue has been demarcated as "believe in empirical facts" which makes the difference to others. Importantly, the

[109]Carnap, *Philosophical Foundation of Physics*,

[110] Suppose, Ohm's law exposes and determines that the influence of electricity through a piece of conductor is proportional to the potential difference between two edges of the conductor. Mathematical equation is V = R*i*. Now, if the influence of electric wave and resistance of electric bulb is known then the potential difference can be determined by the equation V=R*i*.

question comes: how far a philosopher can extend his observation to be an empiricist? Follow three examples a) "Ravens are black," b) "electron never stands at a fixed point in molecule", c) "sting vibrates in a quark". These examples are of variety of human sensuous conductivity. Among them, it is difficult indeed for an empiricists how extend he can permit senses to go for ultimate rummaging. This is obviously a problematic issue for physicists and philosophers as well. Here, they do not agree with each other because physicists virtually allow senses at the last level of tolerance; while philosophers do not count that. So, for the case of example b and c, empiricists may not be allowed by their counterparts to call those empirical statements. So, there remains a gap between physicists and philosophers on the issue of empiricism.

2.3 Mach's difficulties

Philosophers who believe that no theory can be constructed on the basis of human observation alone, they do not accept Mach's philosophy. Moreover, as an orthodox empiricist Mach is criticized by those philosophers who were somehow deviated from strict empirical stance. We can especially mention here some important changes of outlook before and after scientific revolution with an especial reference to Thomas Kuhn. Yet, the physical world remains unchanged, after scientific revolution i.e. shifting of paradigm, human perception towards physical nature changes. Kuhn announces,

> Led by a new paradigm, scientist adopts new instruments and look in new places. Even more important, during revolutions scientists see new and different things when looking with familiar instruments and look in new places they have looked before. It is rather as the professional community had been suddenly transported to another planet where familiar object are seen in a different light and are joined by unfamiliar ones as well. Of course, nothing of quite that sort does occur: there is no geographical transplantation; outside the laboratory everyday affairs usually continue as before.[111]

Kuhn thinks that our observational claims depend upon our theories and beliefs.[112]What were ducks in the scientist's world before the revolution are rabbits afterwards.[113]Here "belief" is much more important than any other issue because it is taken by the

[111] Thomas Kuhn, *The Structure of Scientific Revolution*, The University of Chicago Press, Chicago, USA, 1996. p.111.
[112] Christopher Ray, *Time, Space and Philosophy*, p. 124.
[113] Thomas Kuhn, p.111.

contemporary philosophers as the vital point of physical theorizations. It is importantly envisaged in science, particularly post-positivistic development, that human belief, education, attitude, motivation along with some other related phenomena works with human perception. Whether Mach believe it or not the fact is that 'we find many examples of different people in different places and times who would disagree (sometimes strongly) with even our most basic observational reports, there is no justification for the claim that what we say we see is correct.'[114]It leads to the much-discussed problem in epistemology "limitation of perception". We have a space to discuss this later. Now, we will turn our view to a mathematician and physicist who was a remarkable personality especially for new look of geometry. This is Henri Poincare.

3.4 Julies Henri Poincare´

Henri Poincare´ (1854-1912) was a French mathematician and a noted physicist of his time. He is also remembered for his poetic ingenuity and of course his outstanding contribution to the philosophy of science. He did not have any relation with Vienna Circle (died shortly before the organization) but his mathematical philosophy and geometry and conventionalism as well inspiredlogical positivist movement particularly of Schlick and Carnap. He has contributed much philosophical insight in geometry and physics which ranked him 'great French mathematician'.

In his obituary note[115] Ernest Lebon writes, 'Mathematician, physicist, astronomer, philosopher, Poincare was an author and a poet as well. He sang of the beauties of nature; not that beauty which "flatters" the senses, the "beauty of qualities and appearances" which he despised, but that "special", deeper beauty 'which comes from harmonious and which a pure order intelligence can comprehend'[116]. Friedman writes about Poincare's philosophy of conventionalism and its great influence on logical empiricism though he(Friedman) finally criticized him and says 'this conception of the relationship between Poincare and Einstein rest on a –and, in the end, ironical—misunderstanding of history.'[117] First we will see what Friedman says about Poincare.

> The great French mathematician Henri Poincare is also well known, in philosophical circles, as the father of geometrical conventionalism. In particular,

[114] Christopher Ray, p.125.
[115]Lebon, "Henri Poincare" in*, Publications of the Astronomical Society of the Pacific,* Vol.24, No.145, 1912, pp.260-265.
[116]*ibid.,* p. 265.
[117]Friedman, *Reconsidering Logical Positivism*. p. 73.

> the logical positivists appealed especially to Poincare in articulating and defending their own conception of the conventionality of geometry. As a matter of fact, the logical positivists appealed both to Poincare and to Einstein here, for they believed that Poincare's philosophical insight had been realized in Einstein's physical theories. They then used both—Poincare's insight and Einstein's theories –to support and to illustrate their conventionalism. They thus viewed the combination of Poincare's geometrical conventionalism and Einstein's theory of relativity as a single unified whole. [118]

From two historical notes of Moritz Schlick[119] and Carnap[120], Friedman goes back to the history of logical empiricism: how it convinced two giants of the movements. Even though Poincare's conception of geometry does not completely follow the principle of relativity, however, it develops non-Euclidean geometry from the fundamental point of view. Poincare wrote a preliminary version of special theory of relativity in 1900 just before couple of years of Einstein's paper. Einstein in a lecture *Geometrie und Erfahrung* acknowledges him as a pioneer of relativity theory in 1921. Poincare's contribution to geometry and other branches of philosophy is substantially remarkable. His observation was that 'the velocity of light is a limit velocity' and 'mass depends on speed'. He stresses the need of intuition for mathematical foundation. He classified logic and arithmetic as a system of analytic and synthetic truth respectively. In Kantian sense of the term he argues in favor of synthetic *a priori* truth. But, at the same time he

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[118]Michael Friedman, *Reconsidering Logical Positivism,* p.71.

[119]Schlick writes first article on relativity theory "The Philosophical Significance of the Principle of Relativity" in Mulder and Van de Velde-Schlick(1978-9), vol.1, pp. 153-89. He says, 'Henri Poincare has shown with convincing clarity (although Gauss and Helmholtz), that no experience can compel us to lay down a particular geometrical system, such as Euclid', as a basis for depicting the physical regularities of the world. Entirely different systems can actually be chosen for this purpose, though in that case we also have at the same time to adopt other laws of nature. The complexity of non-Euclidean spaces can be compensated by a complexity of the physical hypotheses, and hence one can arrive at an explanation of the simple behavior that natural bodies actually display in experience. …We are always measuring, as it were, the mere product of two factors, namely the spatial properties of bodies and their physical properties in the narrower sense, and we can assume one of these two factors as we please, so long as we merely take care that the product agrees with experience, which can then be attained by a suitable choice of the other factor.' Pp.168-9. Friedman, *Reconsidering,* p.72.

[120] Rudolf Carnap , in his *Introduction to the Philosophy of Science* writes, 'Suppose, Poincare, wrote, that physicists should discover that the structure of actual space deviated from Euclidean geometry. Physicists would then to choose between two alternatives. They could either accept non-Euclidean geometry as a description of physical space, or they could preserve Euclidean geometry by adopting new laws stating that all solid bodies undergo certain contractions and expansions. … In a similar way, said Poincare, if observations suggested that space was non-Euclidean, physicists could retain Euclidean space by introducing into their theories new forces that would, under specified conditions, expand or contract the solid bodies.' pp. 144-5. Friedman, *Reconsidering,* p.72.

accepts non-Euclidian geometry which upset Kantian a *priori* postulates. Mathematician, he argues, can use logic as a method but he must need intuition to show its validity. In the philosophy of Poincare´, the Neo-Kantian system of thought was transformed into *conventionalism.*[121]It is thought that he was inspired by Lobachevski, a renowned Russian mathematician and scientist, especially by his non-Euclidian geometry. Some important observations about Poincare's philosophy is: a) He observes that Non-Euclidean geometry has the same logical validity like Euclidean geometry, b) It is not possible to announce that any particular geometry is better than other because all geometric system are equivalent, c) Geometric axioms are neither analytic nor synthetic because they are only convention or 'implicit' definition.

Poincare does not seriously advocate for non-Euclidean geometry although he uses this geometry. He actually goes for the criterion of economy and simplicity. Every geometry has its own language, he believes, within the set of axioms but among which one is to be convenient to the user that depends upon its usages. Poincare's thesis on geometry is likewise applicable to the scientific theory. He asserted and stressed on prediction as the function of science rather than interpretation. So, good prediction can substantiate sound scientific theory, he holds. Every scientific theory, thus, can be chosen only by convention. The most important observations about space and time have been clearly demonstrated by Poincare in his *Science and Hypothesis*. Let's move to the section "Classical Mechanics"[122] in his book.

1) There is no absolute space, and we only conceive of relative motion; and yet in most cases mechanical facts are enunciated as if there is an absolute space to which they can be referred.
2) There is no absolute time. When we say that two periods are equal, the statement has no meaning, and can only acquire a meaning by a convention.
3) Not only have we no direct intuition of the equality of two periods but we have not even direct intuition of the simultaneity of two events occurring in two different places.
4) Finally, it is not our Euclidean geometry in itself only a kind of convention of language? Mechanical facts might be enunciated with reference to a non-Euclidean space which would be less convenient but quite as

[121]FedeBenedictus, *Logical Positivism &The Theory of Relativity*, 2009, p.13.
[122]Henri Poincare, *Science and Hypothesis*.

> legitimate as our ordinary space; the enunciation would become more complicated, but it still be possible.

Is it possible to verify or falsify scientific theories by experience? Poincare rejected the possibilities, yet, he thinks that all scientific theories originate from experience. He stands, here, as directly opposite to that of empirical philosophy. He conceives the difference between facts and scientific theories. This is the position which is opposed by Carnap.[123]However, this cannot be denied that Poincare's philosophical insight in geometry has inspired pro-Kantians attitude. Lastly, I will quote from Friedman to understand the position of Poincare in new philosophy.

For, in the general theory of relativity, we construct a non-Euclidean description of nature (as emphasized earlier), not by simply observing the behavior of rigid measuring rods, but rather by fundamentally revising both general mechanics and our theory of gravitational force. The logical positivists therefore sought for an intermediate position, as it were, lying between traditional Kantianism and traditional empiricism. And, it seemed to them that precisely such an intermediate position to be found in Poincare's conception of convention.'[124]

3.4 Einstein and Logical empiricism

It seems to be a somewhat disturbing question for this moment: Was Einstein a logical empiricist? Or, how far his thesis goes on the stage to empirical philosophy? Historically this question leads to a debate upon which philosophers were sharply divided into two parts. Some philosophers like Norwood Russell Hanson, Stephen Toulmin, Thomas Kuhn, and Paul Feyeraband took the challenges in 1960s to debar from any step of pushing him through as a positivist; however, Schlick, Reichenbach and some others provided sufficient documents in order to determine his position as positivist. However, Don Howard argues for both the position: 'the development of Einstein's philosophy and the development of logical empiricism were both driven in crucial ways by the quest for an empiricism that could defend the empirical integrity of

[123] Karl Popper, *Conjecture and Refutations The Growth of Scientific Knowledge,* 1991, Routledge, London, p. 266.
[124] Friedman, *Reconsidering*, p.81.

general relativity in the face of Neo-Kantian critiques.'[125]Howard makes a curious judgment about Einstein's hobnobbing with logical empiricism as, 'logical empiricism was more than a philosophy or relativity theory, and Einstein's philosophy of science was more than an answer to Kant.'[126]Now, we will see in this section what Einstein says in his thesis and what actually logical empiricists express as their theory of empirical actualization.

Einstein was immensely impressed by scientific philosophical writings. Most of his philosophical thoughts were influenced by Kant, Poincare, Hume and Mach[127],yet he differs from them to a great extent. Kantian thoughts, particularly, were extremely reprehended by logical empiricists particularly his synthetic *a priori* scheme. When, by the early 1920s, the gathering neo-Kantian reaction to relativity finally elicited a focused and thoughtful reply from Schlick, it was the notion of convention that provided Schlick an alternative to the a priori.[128]To be sure, whether Einstein was a positivist or not, that judgment solely depends upon the fact that how we take his ideas of space and time and principle of relativity. Since, he announces the farewell to Euclidean geometry and emphasizes on new physical theories based on observations, it obviously paves the way to see through the relativistic thoughts. This new physics is characterized as the most revolutionary thoughts in 20th century. This is a logical starting point, since all of physics is ultimately concerned with measurement depends upon the observer as well as upon what is observed.[129]

One of the students who attended Einstein's first course on the theory of relativity in the Berlin of 1919 was to be one of the foremost adherents of logical positivism.[130] Despite these early signs of speculation and appeal to metaphysical postulates Einstein still regarded himself as a positivist. [131]Why does it is thought and what is that which makes an adherent to be a positivist? Let's go back to Newton's idea of space and time

[125]Don Howard, "Einstein and the Development of Twentieth-Century Philosophy of Science" *in Cambridge Companion to Einstein*, (ed.) by Michel Janssen, ChristophLehner, Cambridge University Press, 2014. p.30.
[126]*ibid.,* p. 30.
[127]*ibid.,* p. 5.
[128]*ibid.,* p. 13.
[129] Arthur Beisar, *Concepts of Modern Physics,*Mcgraw-hill Company, 1963, NY. p.3.
[130]Fedde Bendictus, *Logical Positivism &The Theory of Relativity*, Dieks Institute for History and Philosophy of Science, Utrecht, 2009, p. 27.
[131] Jennifer Trusted, *Physics and Metaphysics Theories of Space and Time*, Routledge, London, 1994, p. 182.

for a while, and then come back to our main agenda. Newton's account of space and time involves the following claims:[132]

1. Space is three-dimensional arena in which objects are located and events take place; no object and no event has any effect on space itself – hence, it is dynamically independent of all the dynamic events taking place within it;
2. time too is independent of all the events taking place in time—and provides an independent and global temporal framework to which all events may be referred in the same way;
3. because of the independent natures of space and time, we may always specify the distance and times between events in an unambiguous way;
4. hence, we may give an unambiguous sense to the idea of simultaneity so that distant events will be regarded as simultaneous regardless of the state of motion of the person who makes the judgment of simultaneity;
5. when an object experiences inertial forces, we may say that the object is indeed in motion relative to space itself, so that acceleration is an invariant quantity which cannot be transformed away by a change of reference frame.

From the above characterizations, it becomes clear that Newton's ideas about space and time are quietly independent of observer which has no relation with experience. It also proclaims that his absolutism refers to three important cases: AE ('absolute'as independent entities or substance; AP ('absolute' as substance possessing invariant properties; AM ('absolute' as irreducible elements in our general account of motion and objects in space).[133]Now, special relativity, however, proclaims that the differences in observations between two such individuals are more subtle and profound. It makes the strange claim that observers in relative motion will have different perceptions of distance and of time.[134]

It is important to remember that Newton advocates for 'absolute' motion, space,and time as well, whereas Einstein rejects those ideas with a view that , 'observers in relative motion will have different perceptions of distance and of time.[135]Now, let's turn to the main discussion.

[132] Christopher Ray, p.135.
[133] Christopher Ray, p. 136.
[134] Brian Greene, *The Elegant Universe*, Vintage Books, NY, 2000, p.25.
[135] *ibid.,* p. 25.

2.5 Theory of Relativity

It was 1919. *New York Times* wrote about the effect of Einstein's theory of relativity under the headlines; *Revolution in science: New theory of the Universe: Newtonian ideas overthrown*:

> Yesterday afternoon in the rooms of the Royal Society, at a joint session of the Royal and Astronomical Societies, the results obtained by British observers of the total solar eclipse of May 29 were discussed. The greatest possible interest had been aroused in scientific circles by the hope that rival theories of a fundamental physical problem would be put to the test, and there was a very large attendance of astronomers and physicists. It was generally accepted that the observations were decisive in verifying the prediction of the famous physicists, Einstein, stated by the president of the Royal Society as the most remarkable scientific event since the discovery of the planet Neptune. But there was a difference of opinion as to whether science had to face merely a new and unexplained fact, or to reckon with a theory that would completely revolutionize the accepted fundamentals of physics.[136]

This was about the prediction of light ray comes near from the sun which says that it 'bends' by the effect of massive gravity adjacent to the sun. The prediction from the general theory of relativity comes to be true when a group of scientists led by Sir Arthur Eddington arranged the experiment near west coast of Africa. Soon after his epoch-making creation he was requested by the British people to present the essential feature of his theory. He told to the readers 'In the generalized theory of relativity, the doctrine of space and time ... is no longer one of the absolute foundations of general physics' (Einstein: 28 November 1919)[137]

I think no physical theory has ever influenced human thoughts in history like the theory of relativity. It is as like as the idea about the universe before and after Copernicus. Before Copernicus, there was an idea that the entire world revolves round Earth while Copernicus finds that thisis not Earth but the sun is middle of the whole system.

[136]This report is taken from the book of Christopher Roy, *Time, Space and Philosophy*, Routledge, London and N.Y p.1.
[137]Christopher Ray, pp.1-2.

Likewise, Newtonian physics believes that space, time and motion are absolute, independent, infinite and three-dimensional but, Einstein holds diametrically opposed views to that of Newton. He proposes, nothing can be said to be absolute because space-time and motion are relative, finite, and four dimensional. Moreover, its philosophical implications are very much close to the empiricist position about space and time. Schlick writes, 'Albert Einstein is the guide who has directed us along a practicable path leading to these summits. Employing as astoundingly ingenious analysis, he has purged the most fundamental conceptions of natural science by removing all the prejudices which have for centuries past remained undetected in them: thus revealing entirely new points of view, and building up a physical theory upon a basis which can be verified by actual observation.'[138]

3.5(a)Special theory of relativity

Einstein's special theory of relativity is based on two important postulates:

i) The laws of physics may be expressed in equations having the same form in all frames of reference moving at constant velocity with respect to one another.[139]

ii) The speed of light in free space has the same value for all observers, regardless of their state of motion.[140]

The basis of these postulates is found in 1887 following the result of Michelson-Morley's experiment who were two famous American physicists. This result appears to be bizarre to our known ideas about the motion of bodies. This is supposed to be incongruent and unnatural with our known experience. Let's imagine, we are in a compartment of a train which is running at the speed of 200kms/hrs. We are very near to the window from where everything is being clearly observed. During the time of our travel a train is also supposed to come from the opposite side with the same speed (200kms/hrs.). Now, what our experience would say about the speed of other train? Our common sense says, it seems to be (200+200) =400 km/hrs. Not only for this particular case but also for all cases, our experience shows the same records. Anything that travels

[138]Schlick, *Space Time in Contemporary Physics*, p.15.
[139]Arthur Beiser, *Concept of Modern Physics* , p.10.
[140]*ibid.,* pp.10-11.

lesser than the speed of light shows the same result. But, for the case of light it happens to be different. Suppose, if we travel in a spaceship with the speed of 1 lac km/sec. towards the source of light, what will we see for this especial case? Our previous experience may convince us to understand it 3 lac km+1 lac = 4 lac km/hr. But this known hypothesis is not pertinent to this particular issue. That is fundamentally different to the case of light. It is always 3lac km/sec[141]. Therefore, the speed of light is constant c. It should also be remembered that from the Michelson-Morley's experiment, the concept of 'aether' becomes void yet it was very important in older physics. Accordingly, the salient feature of their experiment is as follows:

a) There is no aether in the universe.
b) Galilean transformation law is not correct.
c) The velocity of light is constant. It does not depend upon the source, observation, or the velocity of medium.

Again, inertial frame of reference in Einstein's physicsis very important. This frame of reference is needed to identify anything's coordination or to define something's motion. Suppose there is a ceiling fan in a room. To identify its coordination, any corner of the room is taken to be the axis from where it is to be measured. But if the origin is changed with any direction its axis's will be changed. Among many others coordination, Cartesian coordination system is our best known frame of reference. Importantly, Newton's first law of motion was thought to be applied in the inertial frame of reference. When something's velocity is taken into consideration in terms of other moving bodies (not in terms of accelerated) that is inertial reference frame.

Lorentz Transformation

The transformation law of HendrikLorentz is established on anothertwo important postulates:

i) laws of physics can be same in all frame of references; if it takes the same velocity in respect to others;

[141] The exact velocity of light is 299792458m/s. we usually take it 3.0x 10*8 m/s. From the theory of relativity we come to know that the speed of light is the highest among everything of our known phenomena. It can never be reduced or increased.

ii) the velocity of light is constant in a vacuum place. It must be same if it transforms one frame of reference to other. Its velocity never depends upon the observer's position.

Its major prediction was: i) length contraction[142], ii) time dilation[143] and iii) relativity of mass[144] which is considered as the major outcome of Einstein's special theory of relativity.

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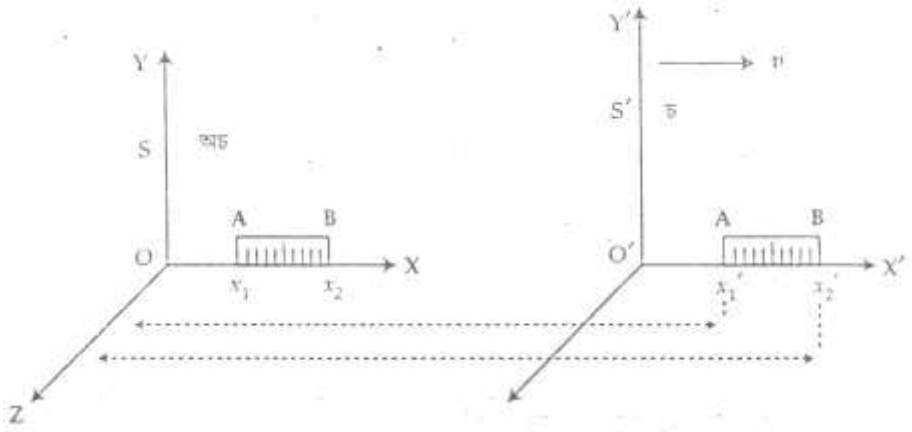
[142]The contraction of length of any object during the time of its motion than its position at rest is called length contraction. Suppose a bar of a rod is lying along the X axis of "S" frame of reference. Its coordination of the two ends is supposed to be X_1 and X_2. So the length of the rod is $L_0 = (X_2 - X_1)$. Here, L_0 is the length of the rod that is measured in S frame of reference. Now suppose the same rod is thought in another frame of reference "S′" which is moving at the speed of v. If any observer wants to finds the length in this new frame of reference Ś he calls it X'_1 and X'_2. Now, the length of the rod is now $L = (X'_2 - X'_1)$. According to the Lorentz transformation equation,

$X_2 = X'_2 + v.t/\sqrt{1 - v^2/c^2}$…. … (1)

$X_1 = X'_1 + v.t/\sqrt{1 - v^2/c^2}$…. … (2)



Now, deduct from equation 2 to 1, (2—1):

$X_2 - X_1 = X'_2 - X'_1/\sqrt{1 - v^2/c^2}$

Or, $L_0 = L/\sqrt{1 - v^2/c^2}$ $[X_2 - X_1 = L_0]$ & $[X'_2 - X'_1 = L]$

So, length contraction $L = L_0\sqrt{1 - v^2/c^2}$

This equation proves that $L_0 > L$. Therefore any observer in the S frame of reference will observe the rod in the Ś frame of reference contracted by $\sqrt{1 - v^2/c^2}$.

[143]Einstein first says that time is also affected by relative motion. Any event happens in a static frame of reference may therefore be different in a moving frame. The effect is called time dilation. Suppose S and Ś are two different frame of references in which S is static and Ś is on moving. Let us think that a clock is at the point

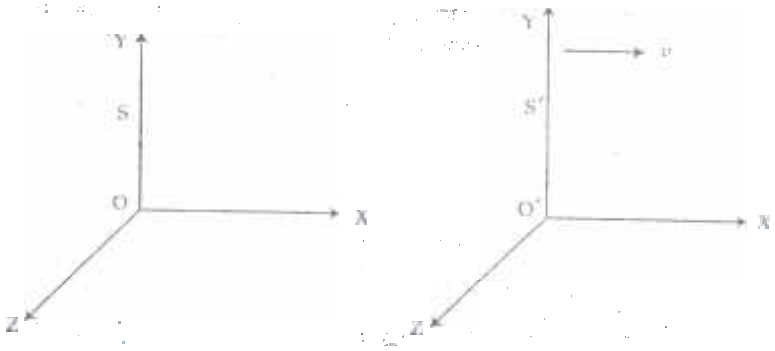
of X` axis. An observer follows an event $t`_1$ in S frame. In Ś, which is moving at the speed of v has been marked by the same event by $t`_1$. Now according to the inverse Lorentz transformation equation,

$t_1 = t'_1 + v.\ _X'/\ c^2\ /\sqrt{1-\ v^2/\ c^2}$ … … (1)

Now after t_0 time the observer of Ś will find that his time is t'_2; $t_0 = t'_2 - t'_1$. Hence, the observer of S frame finds his time t_2.

$t_2 = t'_2 + v.\ _X'/c^2/\sqrt{1-v^2/c^2}$ … … (2)

So, to him the duration of the interval t is



$t = t_2 - t_1$

$= t'_2 - t'_1/\sqrt{1-\ v^2/\ c^2}$ [hence, $t_0 = t'_2 - t'_1$]

Therefore, $t_0 = t/\ \sqrt{1-\ v^2/\ c^2}$

So this equation announces that $t > t_0$. It proves that time in moving frame time is dilated.

[144]Mass of an object is also depended on its motion like its length and time. According to the relativity theory mass of an object increases with its velocity. This is called relativistic mass. Suppose S and Ś are two frames. Ś frame is in motion at the axis of X with the speed of v. Two observers of S and Ś are observing elastic collision of two particles A and B. Two particles are in the same mass. Suppose before collision the particle A is in S frame and particle B is Ś frame are in at rest. Now the particle A has been thrown at the +Y axis with the velocity v_A and particle B thrown in the direction of –Y axis with the speed of v_B'. Here, $v_A = v_B'$. So the behavior of the particle A in the Ś frame is identical to the behavior of B in the Ś frame. Then after collision, particle A with the velocity v_A rebounds in the direction of --Y and B rebounds with the velocity v_B in the direction of +Y. If the distance of the particles is y at the outset then an observer in S frame finds that the collision occurs at $y=1/2_Y$ and the observer in Ś frame finds that it occurs at $y' = 1/2_Y$. Now the time of round-trip of A in S.

$t_0 = _Y/\ v_A$..... (1)

this is same for B in Ś frame.

$t_0 = _Y/\ v_{B'}$. .. .. …. (2) ; if the momentum is preserved in the S frame ,

$m_A v_A = m_B v_B$…. …..(3)

2.7 General theory of relativity

Soon afterpublication of the special theory of relativity Hermann Minkowski (1864-1909), an illustrated German mathematician and teacher of Einstein says, Einstein's theory can best be understood by four dimension space. Space and time are not separate entities but it is "space-time-continuum". Minowski says, 'the views of space and time which I lay before you have sprung from the soil of experimental physics, and therein lies their strength. They are radical. Henceforth, space by itself, and time by itself, are

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Here, $m_A$and m_B and v_A and v_B are the mass and velocity of the particle A and B in the S frame. In S, the round-trip t of B is

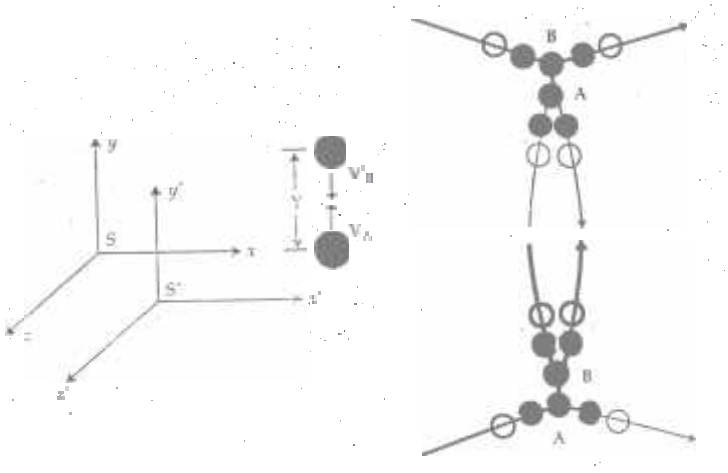
$t = y/ v_B$, or, $v_B = y/t$.. ……..(4)

Although two observers are holding the same events in their respective frame but they do not agree with the time. In Ś frame, B's trip requires the time t_0, this time, $t = t_0/\sqrt{1- v^2/ c^2}$, Now put the value of t in the equation 4; $v_B = y\sqrt{1- v^2/ c^2} / t_0$.

We find from the equation $v_A = y/ t_0$. Therefore, put the value of v_A and v_B in the equation.

$m_A . y/ t_0 = m_B . y\sqrt{1- v^2/ c^2} / t_0$, or$m_A = m_B\sqrt{1- v^2/ c^2}$…. …(5)

At the outset, our hypothesis was the identical of the particles. But the equation 5 shows that this is not correct. So $m_A \neq m_B$. This theorem clearly shows mass of an object is also depended on relative velocity like place, time. Now in S, $m_A = m_0$, and $m_B = m$, $m_0 = m/\sqrt{1- v^2/ c^2}$.It finally holds that the mass of object increases with the increase of velocity.



doomed to fade away into mere shadows, and only a kind of union of the two will preserve an independent reality.'[145]Minkowski told Max Born that it came to him as a great shock because he [Minowski] independently reached at the same conclusion like Einstein but waited for its splendid mathematical formalism. However, he always gives the priority of Einstein in full length. Einstein in his *Autobiographical Notes* acknowledges his teacher's excellence:

I had excellent teachers (for example, [Adlof] Hurwitz, Minkowski), so that I should have been able to obtain a mathematical training in depth. I worked most of the time in physical laboratory, however, fascinated by the direct connect with experience. The balance of the time I used, in the main, in order to study at home the works of Kirchhoff, Helmholtz, Hetrz, etc.'[146]

The general theory of relativity appears to be the *ultimate defeat* of absolute notion of space and time. This is also an initiative to turn the entire human thoughts away from their conventional mode of belief. Newton's basic idea about space and time has been summed up in different categories.

i) all objects are located in three-dimensional space. It is dynamically independent of all the dynamic events taking place within it; [147]

ii) time is completely separated from all the events. It provides an independent and global temporal framework to which all events may be referred in the same way.[148]

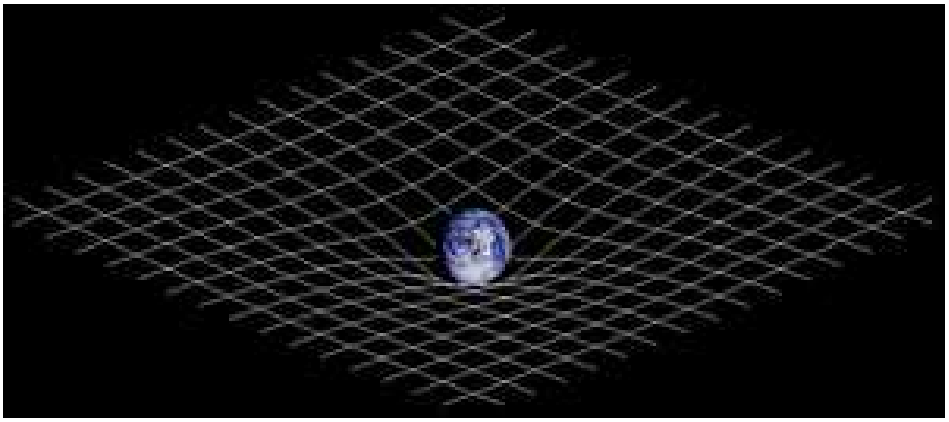


Figure: Space-time curvature

[145] Hermann Minkowski, Raum und Zeit, *PhysikalischeZeitschrift*, 10: 104-111, 1909. This quotation is cited by FeddeBenedictus, in Logical Positivism &The Theory of Relativity, p.15.
[146]Einstein, in Schlipp, 1949, p.14-15.
[147] Christopher Ray, *Time, Space and Philosophy*, p.135
[148]ibid., p.135

Moritz Schlick writes, 'Employing an astounding ingenious analysis hence [Einstein] has purged the most fundamental conception of natural science by removing all prejudices which have for centuries past remained undetected in them: thus revealing entirely new points of view, and building up a physical theory upon a basis which can be verified by actual observation.'[149]

2.8 Philosophical importance

In old physics electro dynamical experiments give an observer no indication as to whether he and apparatus are at rest or moving uniformly and rectilinearly.[150]Schlick sees the whole issue as follows: '… experience teaches us that the following theorem holds for all physics: 'all laws of physical nature which have been formulated with reference to a definite coordinate system are valid, in precisely the same form when referred to another co-ordinate system are valid, in precisely the same form, when referred to another co-ordinate system which is in uniform rectilinear motion with respect to the first'.[151]He further writes, 'this empirical law is called 'the especial theory of relativity' because it affirms the relativity of uniform translation only, i.e. of very especial class of motions. All physical event take place in any system in just the same way, whether the system is at rest or whether it is moving uniformly or rectilinearly.' [152] Einstein himself has clarified his position in a lecture in London:

> I am anxious to draw attention to the fact that this theory is not speculative in origin; it owes its invention entirely to the desire to make physical theory fit the observed fact as well as possible. We have here no revolutionary act, but the natural continuation of a line that can be traced through centuries. The abandonment of certain notions connected with space, time and notion, hitherto treated as fundamentals, must not be regarded as arbitrary, but only as conditioned by observed facts.[153]

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[149]Moritz Schlick; *Space Time in Contemporary Physics*, p.1.
[150]*ibid* p. 10.
[151]*ibid.,* p.10.
[152]*ibid*, p. 10
[153] A. Einstein – letter to Besso, 28 August 1918. Quoted by Gerald Holton *in Thematic Origins of Scientific Thought, Kepler to Einstein*, Harvard University Press, Cambridge, 1973.p. 233. This is taken from Jennifer Trusted, in *Physics and Metaphysics,* p.183.

What induces us to think about space and time when we are talking about positivistic philosophy? Or how the logical empiricist makes a bridge between modern physics and empirical philosophy on the crucial issues that happened to be compatible? These questions are of great importance because our whole thesis is revolved round a question: is it possible to build up scientific knowledge without empirical thoughts. It has already been mentioned that, the only fundamental issue on which the philosophers are contending with is the basic function of philosophy. Logical empiricist holds that the function of philosophy is not only to make a clear sense of our every day's belief; it is an activity thereafter. Therefore philosophy can never be a branch of human knowledge if it remains within its parochial purview.

Furthermore, if we attempt to make a clear sense of natural science and explore an epistemological foundation of modern physics we need to have a precise definition of space and time and its actual dimensions. It is very important to note that during the time of knowledge formation in human mind we need to have direct correspondence with the object or space. Every event must happen within a definite of space-time structure. So how these spaces and time come with the contact of human mind that needs to be judged. Modern physics teaches us: nothing is above our experience. We need direct intervention during making our theorem. Here I will say that there is a good relation between our experience and the result of relativity theory. Einstein replies, it is deeply related with human experience. He says, 'The special theory of relativity has crystallized out from the Maxwell-Lorentz theory of electromagnetic phenomena. Thus all facts of experience which support the electromagnetic theory also support the theory of relativity.'[154]

Kant has clearly articulated that all scientific knowledge comes from synthetic *a priori* judgment. Kant writes, 'Time and space, are, therefore, two sources of knowledge, from which bodies of a *priori* synthetic knowledge can be derived.'[155] He also writes, 'Time and space, taken together, are the pure forms of all sensible intuition, and so are what make *a priori* synthetic proposition possible'.[156] Logical empiricists explain and oppose the peculiar synthesis between "synthetic" and "a priori". They have clearly differentiated two different kinds of proposition- synthetic and analytical, in which mathematics and geometrical proposition falls under latter division. So the logical

[154]Albert Einstein, *Relativity: The Special and General Theory,* p.
[155]Immanuel Kant, *Critique of Pure Reason*, (Trans. N. Kemp Smith), Macmillan ST. Martin Press, p.80.
[156]*ibid*., p.80.

empiricists, like Schlick, Carnap, Reichenbach, outrightly rejected Kantian major dictum. For logical empiricists, no synthetic proposition can be *a priori* because its major characters are non-reciprocal between subject and predicate. Friedman sates, '… they are reacting to nineteenth-century work on the foundations of geometry by Guass, Riemann, Helmholtz, Lie, Klein, and Hilbert – a development that, for the logical empiricists, culminates in Einstein's theory of relativity.'[157] The nature of analytical proposition is that it comes to be self-contradictory to deny. This is also called "necessary" proposition. So the nature of classical geometry is supposed to be taken as the analytical part because of its reciprocal characteristic between subject and predicate. We take a postulate of geometry, 'if two triangles have their corresponding sides proportional, they are equiangular.' If this is taken to be a proposition which has a subject and predicate must be interchangeable from either side. According to the later development of geometry which is now known to be non-Euclidian in nature must break down its previous character. Since it is depending upon human experience, it must no longer be a priori in every respect.

Reichenbach says, 'that axiom of coordination, which paradigmatically include principles of physical geometry, are "constitutive of the concept of the object of knowledge'' and they are thus a priori in part of the Kantian sense of the term.'[158] Nevertheless, this can't be denied that 'no geometry is necessary and true for all time."[159]. In every scientific theory this basic tenet has been incorporated as the fundamental postulate of modern physics. I will conclude this section by giving a quotation from Friedman from his remarkable book *Reconsidering Logical Positivism*:

' in the context of Newtonian physics, Euclidean spatial geometry, Galilean kinematics, and, more generally, the structure of Newtonian space-time all count as axioms of coordination and are thus a priori in the constitutive sense *relative* to this theory. Axioms of connection include particular force laws such the law of gravitation, whose empirical testing then presupposes that the structure of Newtonian space-time is already in place. Kant's analysis is therefore correct for Newtonian physics as an historically given theory. In special relativity, however, we change - under pressure of new empirical findings – precisely the background space-time structure' [160]

[157]Michael Friedman, *Reconsidering Logical Positivism*, p.60.
[158]*ibid.,* p.60.
[159]*ibid.,* p.60.
[160]Friedman, *Reconsidering Logical Positivism*, p. 60.

2.9Quantum physics and Logical empiricism

At the beginning of this section I have proposed to discuss about philosophical relationship with two important developments of physics in which relativity theory has been concluded above; now I will go for another topic, Quantum Mechanics. It is very commonly held that there were serious philosophical contradiction between the theory of relativity and Quantum physics since they deal with two different worlds—one is very big universe, another is incredibly small. They are invariably correct for their respective field; however two results of these distinct fields do not thanks each other. Many physicists hold that they cannot both be true at the same time because their results are mutually incompatible.[161]Physicists do not believe in the "riddle" of the nature. They always strongly argue that this whole universe is an explication of one and undivided beauty. So, there should not be apparent contradiction between these two areas of nature. Perhaps, once the scientists may find out the fundamental clue of a unified grand theory by which they will be able to understand the nature. Einstein, in his entire life time, searches for such a theory of everything (!), but the nature does not permit him as he expires early!

Modern physics especially post-Newtonian development is fundamentally different to its previous physics. It is different at least in two ways: post Newtonian development is much more philosophical where human speculations have been brought under considerations along with experimental findings. Another, it is deeply accredited as the consequence of philosophical assumptions where many thing depend on the experimenter Quantum mechanics, especially its Hisenburg principle of indeterminacy[162] has been notable for the change it has brought in the physicist's epistemological theory of the relation of experimenter to the object of his scientific

[161]Brian Greene, *The Elegant Universe*, p.3.

† Einstein did not believe in many postulates of Quantum theory although he is responsible for introducing Quantum theory. There was a long debate with Niels Bohr.

[162]Physicists in second decades of 20th century explore an outstanding philosophical interpretation of physics about the nature of particles whether it is measureable in a particular time. Niels Bohr (1885-1962) and Werner Heisenberg (1901-1976) made this issue very clear to the reader. What is the fundamental issue that brings logical empiricism very close to Quantum physics? Principle of Uncertainty (POU) is thought to be the basic pillar among many other philosophical issues in Quantum physics. Heisenberg, in 1927, has clearly advocates that it is not possible to determine an electron's position and momentum at the same time. This is actually an *unavoidable uncertainty* for these conjugate variables. When we want to measure the velocity (V) of an electron accurately its position(S) goes back to our reach or vice versa.

$$\Delta V \, \Delta S \geq h$$

knowledge.[163]So, a growing tendency appears with the advent of new physics in which "human concept" are deeply incorporated with.

No doubt, Quantum theory between 1900 and 1927 has had a major impact on intellectual advances made by some physicists like Niels Bohr, Erwin Schrodinger, Max Born, Werner Heisenburg, Wolfgang Pauli, Henry Lorentz, and of course, Albert Einstein†.

2.9(i) Copenhagen Interpretation of Quantum Mechanics

Copenhagen interpretation (CI) is the most popular explanation of Quantum mechanics which has a long historical development through the works of physicists like Bohr, Heisenburg, Neumann and others. It is argued that the rise of logical empiricists' movement is contemporaneous to the CI.Logical empiricism stands as an anti-realistic justification of scientific knowledge which may close to the CI in a sense that CI finally interprets Quantum mechanics instrumentally. Now, what is the basic idea of Quantum interpretation that explainsthis physical world? Copenhagen interpretation is basically a theoretical interpretation of experiment which makes the difference from its previous physics—classical physics. In classical physics, measurement of physical events, position and velocity of planet for example, is predictable. Astronomer predicts exact time of an eclipse of the moon by applying the theory of classical physics. Now, Quantum physics is slightly different. To be sure, it is practically impossible to determine the position and velocity of electron because no experiment can be accurate; however, it takes to be genuine. At the time of measurement it always works a probability function. This probability function represents a mixture of two things, partly a fact and partly our knowledge of a fact.[164] This can be happened for knowledge of fact is that we can't measure accurately due to the deficiency in our knowledge of electron. However, it remains a crucial question: what actually happens in the atomic events? Heisenberg says, 'so we cannot completely objectify the result of an observation, we cannot describe what 'happens' between this observation and the next. This looks as if we had introduced an element of subjectivism into the theory, as we meant to say: what happens depends on our way of observing it or on the fact that we observe that.'[165]This

[163] F. S. C. Northrop, Introduction, of Werner Heisenburg's *Physics and Philosophy,* George Allen &Unwin Ltd, London, 1959,p. 11.
[164]Werner Heisenberg, *Physics and Philosophy*, George Allen &Unwin Ltd, London. P. 47.
[165]*ibid.,* p.51.

is the basic point where logical empiricism and Quantum theory intersects with each other. In logical empiricism, there has always been a tendency to reduce all events into the observable facts. And an observable fact ultimately wants to be justified by subjective interpretations.

2.9ii) Niels Bohr and logical empiricism

In 1936, the second congress for the unity of science was held in Copenhagen which is remarkably pondered as the milestone of modern physics. Jørgen Jørgenson, philosopher at the University of Copenhagen and the leading member of logical empiricism in Denmark, was present in the congress along with many other physicists in which Niels Bohr, the father of atomic theory played the prime role. Bohr is the exponent of Copenhagen Interpretation (CI)of quantum mechanics. Another active member of the conference was Otto Naurath who was chiefly responsible to draw the attention of the physicists on epistemological hobnobbing with positivistic mode of knowledge. Danish philosophy and culture as well was very much influenced by positivistic philosophy. Jan Faye writes, 'it also impinged on the cultural avant-garde and via them on the public debate concerning social and political reforms'[166].He also writes, 'Hand in hand with the positivistic ideas you find functionalism emerging as a new heretical language in art, architecture, and design. Not surprisingly, you may say, since the logical positivists' wishes of stripping philosophy of metaphysics is spiritually similar to the functionalists' desire to get rid of symbols and ornaments.'[167]

It is believed that Neils Bohr, primary architect of the CI, was influenced by the spirit of logical empiricism because he sees that it has a close affinity with practical justification of verificationist epistemology[168].

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[166]Jan Faye, Niels Bohr and Vienna Circle, Department of Media, Cognition and Communication, Section for Philosophy, University of Copenhagen, p. 1.

[167]*ibid.*

[168]In 1934, Neurath wrote a letter to Caranp about Bohr: "Bohr. Idiosyncratic.An intense man. Came to two lectures and joined the discussion enthusiastically ... Basic line: he does not want to be considered a metaphysician. And he is able to express himself relatively non-metaphysically, when he is careful. Yet obviously there lies a certain tendency in the selection of problems, insofar as the question of life, etc. is discussed, as well as in the stress on uncertainty. In addition, his printed remarks are full of crass metaphysics. But he possesses certain basic attitudes which agree with mine,

In 1935, Einstein along with two other physicists B. Podolsky and N. Rosen wrote a small paper "Can quantum-mechanical description of physical reality be considered complete?" where they try to make the physicists understand that as a theory Quantum description is not complete. It is written, 'In a complete theory there is an element corresponding to each element of reality. A sufficient condition for the reality of a physical quantity is the possibility of predicting it with certainty, without disturbing the system. In quantum mechanics in the case of two physical quantities described by non-commuting operators, the knowledge of one precludes the knowledge of the other.[169]Thus, Einstein finally doesn't accept the quantum-mechanical description of physical reality. And, he has had a fierce debate with Bohr on certain grounds. Meanwhile, Bohr's metaphysical interpretation of physical objects, on the other hand, came under attack by Neurath before Copenhagen conference. The criticism was convincing, so Bohr makes some amendment on his idea that helps him to go on to the debate with Einstein.

S. Hawking, in recent years, echoed the same voices in line with his astrophysics research. He supports the principle of induction and its justification for acceptance. In philosophy of science, he opines at the agreement with positivists in a sense that scientific prediction and its accuracy depends on its workable hypothesis. He writes,

> Any sound scientific theory, whether of time or of any other concept, should in my opinion be based on the most workable philosophy of science: the positivist approach put forward by Karl Popper and others. According to the way of thinking, a scientific theory is a mathematical model that describes and codifies the observation we make. A good theory will describe a large range of phenomena on the basis of a few simple postulates and will make definite predictions that can be tested.[170]

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e.g., that in science one cannot clear up everything at once, but that the individual scientific-logical actions have to pay a price, as it were. An idea of compensation, which with him naturally tends to be connected with the uncertainty relation. Obviously tries to come into agreement with us. But since his circle confirms him in his habit to express himself somewhat unclearly, one would have to be able to work on him for a long time, which he would be prepared to do."

[169]Physical Review, vol. 47, 1935. p.777.
[170]Stephen Hawking, *The Universe in a Nutshell,* Bantam Press, London, New York. p.31.

Hawking's position is very clear about positivism. If any prediction about a theory, he argues, agrees with the observation, the theory survives. And if it fails to do that it needs to discard or to modify. It is important to note that hawking rejects the so-called barrier between observation and theory in one respect or another. He claims to be a posivistand says, ' If one takes the positivist position, as I do, one can't say what time actually is.[171]

I will make a summary of the above discussion here. To understand nature and to have a clear picture of the physical world two important branches of physics –- theory of relativity and quantum physics – works invariably in macroscopic and microscopic level of human understanding respectively. These two physics were developed during the heyday of logical empiricism–-the philosophy which is basically propelled through human empirical understanding. Einstein (1879--1955) the most powerful physicist cum philosopher in history was influenced by Hume's philosophy of sense-experience and Mach's principle of reduction. The theory of relativity, both special and general, comes out at the very period of Russell and Wittgenstein's theory of atomism and the initial phase of logical empiricism. I strongly believe that philosophy of Hume and Mach are entirely responsible in changing the mind of Einstein over the issue of space and time. Newtonian physics was in absolute dominance in the area of classical mechanics whereupon Einstein dismissed his theory of motion and the whole idea of space-time continuum. Further, Einstein overrides the geometry of Euclid that is supposed to be the backbone of Newtonian space. Therefore, length contraction, time dilation and increases of mass are the prediction of special relativity. On the other hand, Einstein changes human ideas about the law of gravitation as the most powerful result of general relativity. Both the version of his theories expound to the fact that *nothing in the world can be accepted without observation and experiment* or *all knowledge of physics must be based on experience.* Theory of relativity categorically excluded absolutism and declares that nothing is independent. It immediately follows that absolute object inevitably brings us beyond the perceptual world.

Quantum physics another revolution in the physical world tremendously pushes us an uncertain glory that only *inspire not to ask any question beyond what is likely to be appearance.* W. Heisenberg (1901-1976) one of an influential producer of quantum physics invents the principle of uncertainty which obviously finds indeterminacy of electron's mass and velocity at the same moment. As a result, scientists assume that *there can never be any sense of reality beyond appearance*. Neils Bohr (1885-1962),

[171] *ibid,* p.31

leading physicist and positivist have had a great influence on the philosophy of experience during the best time of the positivists.

Undeniably, logical empiricists liked to hobnob with those physicists who were practically or principally make a bridge between physics and philosophy, because both the branches of human knowledge try to understand the secrecy of nature.

3.

SCIENTIFIC KNOWLEDGE, LANGUAGE AND EXPERIENCE

For the term, scientific background, I have extended the denotation where it is shown that "scientific" means not only the theory of relativity or Quantum mechanics but also the scientific language on which our philosophical thoughts stand. It also speaks about scientific structure of language i.e. logical structure that follows the valid rules of language. In this section, I will try to prove that any knowledge which claims to be scientific must need to follow the valid process of reasoning.

Bertrand Russell (1872-1970) who is always thought to be a forerunner of logical empiricists[172] says, '… every philosophical problem is a problem of analysis and the business of philosophy is essentially that of logical analysis followed by logical synthesis.'[173]Obviously, this can't be denied that modern philosophy takes a new shape at the turn of 20th century by the influence of natural science. With the advent of new horizon philosophy gradually embraces linguistic excavation by the especial kind of empiricist i.e. logical empiricist. They advocate that modern philosophy has nothing but to explore linguistic entanglement to unravel the truth. In addition, they argue that since it is the picture of reality so it is possible to draw the limit of language in order to justify meaningful and meaningless expression. It is possible because it can easily make the distinction between meaningfulness and meaninglessness.[174]. Accordingly, if something lies beyond the limit it is necessarily proposed to reject as meaningless.

Logical empiricists unequivocally stand against all super-sensible languages and expressions which do not comply with our senses. More precisely, they only categorize those expressions as human knowledge which is capable of being verified either directly or in principle at length. Then the question remains critical: what actually do we mean by language? And, how does language maintain relation with reality? Furthermore,

[172] Bertrand Russell has a strong inclination to empiricism but he never agrees with the basic point of logical empiricism. He does not think that all the sentences which we think meaningful need not to be verified to be meaningful. He stands against this position up to the last stage of his philosophical career. Ayer concedes his debt to Russell in the long preface of his masterpiece *Logical Positivism* published in 1959. Furthermore, Russell writes against logical empiricists as follows: 'some modern empiricists—in particular, the majority of logical positivists—have, in my opinion, misconceived the relation of knowledge to experience.' *Human Knowledge*, p.463.

[173] Bertrand Russell, *Logic and Knowledge*, p.341.

[174]Ludwig Wittgenstein has expressed the idea in his *Tractatus Logico-Philosophicus* though he changed his mind at the later phase of life.

which languages are finally systematized as an invariable part of human cognition? It exhorts so many questions in this section where we will start by putting the price on the various functions of language. Language, therefore, plays the chief role by which we make the distinction between meaningful and meaningless expressions.

What does language do for human being that makes it invaluable among human creations? Is it entirely different to those of the animals who don't have lexicon or grammatical syntax? Moritz Schlick makes a very nice judgment about the function and role of language: 'human civilization rests entirely on the possibility of communication of thoughts. There would be no communication between human beings if man could not exchange ideas with his fellow men'.[175]

I think the function of language is virtually more than that. It is definitely impossible to make any progress for human society without communication. So, communication among the species or even sometimes among inter-species are given utmost priority for handing down knowledge from one stage to another. In effect, human life would have been quietly impossible if no language is set in to working out among the species. Language, wholly, makes the bridge between people to express one's desire or to generate knowledge for others. We can't think a world where people can't make out each other for want of successful communication. Even though, people have discovered some ways of communication for deaf and dumb however it lacks full course of linguistic dictation. Modern linguists invented some especial tactics for them to make successful rapport with each other by using fingers and some especial bodily movement. Although it fails to communicate in all, nevertheless, it is taken to be an especial language. I must say language is the best invention ever that has been created by man. There would have been no major differences with animals if man could fail to find out specific rules of communication i.e. language.

Language, religious language particularly, is saturated with human lifein an extra ordinary fashion. In old days, language was used not only for communication but also to do harm to others by the medicine man. Language basically has two purposes, expression and communication.[176] Music is a strong medium for human mental provocation. On the other, communication does not consist only of giving information; commands and question must be included.[177]So, in all respects language is in urgent

[175]Schlick, p.285.
[176] Bertrand Russell, *Human knowledge*, Routledge, 1948, p. 72.
[177]*ibid*., p.73.

need for human life and its meaningful progress. It is evident that, 'word' which is considered as the unit of language is the most elementary concept of human life. Russell writes,

> 'Words, from the earliest times of which we have objects of superstitious awe. The man who knew his enemy's name could, by means of it, acquire magic powers over him. We still use such phrases as "in the name of the law". It is easy to assent to the statement "in the beginning was the word". This view underlies the philosophies of Plato and Carnap and of most of the intermediate metaphysicians.'[178]

But it should be remembered that word itself can't be the subject of reverend; what we want to do by using word should be the subject. Language is, actually, a collection and consistent operation of some basic rules which are entirely made up with some mutual understanding by the users. What do we understand by the word 'laptop'? It just implies an especial computer. What is the problem then if we indicate a piece of 'rock' by the word laptop? Yes, it is a serious problem. But it does not create any problem of course if we are agreed upon now to alternate the meaning of 'laptop' and 'rock' from the time on. I think no problem will be there if anything is done through human understanding thereupon. Even, we usually find the difference of pronunciation of a word in a same region by the people. Laptop is sometimes pronounced by the people as 'laftop'or 'laftof' or may be 'layftop'. However, we only mean laptop in spite of some sorts of different pronunciations. Therefore, it is assumed that there is no fundamental difference among the nations for the use of language. Russell says, a word is a universal.[179]What does it mean? It means if all dogs in the world are killed now or deemed to be an extinct species thereupon but in effect the idea of dog will never be vanished from the mind. In fact, it is generally admitted that words are universal ideas that comprises innumerable individuals. It, now, happens that, if the word "DOG" is written in a piece of rock, nobody thinks it to be dog. Lastly Russell stands against the nominalists and says, although word is universal but it is the part of the world. And, finally he holds that it is nothing like a golden mountain or any other human fantasy which may indicate something non-existent.

[178]Bertrand Russell, *An Inquiry into Meaning and Truth*, Routledge, London and New york, 1992, p.23.
[179]ibid., p 24.

Now, someone may ask then, what does the animal do when they are out to exchange the views within their own society? Don't they have any language? If not so, how could they exchange their desire or passion to others? To be sure, when the kite in the sky takes the chance to prey on chicken; mother-hen suddenly makes a bizarre sound to warn her baby. In reply, babies, in a jiffy, being warned with that sound hide themselves inside the hen-boost. Likewise, monkey in the deep forest, soon before attacked by leopard, express an especial sound to warn other animals in an apprehension to possible attack which has also a definite meaning. Parrot can makes nice sound like man. It can effectively convince man as their best pet. However, this especial tactic or sound entails nothing in final since all of those sounds have no structure or rules of business for successful rapport within intra-species and henceforth it is, in most part, meaningless. Some natural events also work for as language of other kinds for human understanding. Black cloud, for example, indicates the storm or the red light in the street implies some messages to be stopped there. Therefore, some artificial languages also carry the same weight in order to maintain human life possible. But, we will keep off such natural symbols and indications for definite reasons even though it provokes human sense of thoughts effectively. The contention here is to prove that, language, in spite of its various usages must need to follow specific rules and grammatical semantics to be understandable for everyone. In addition, it is an attempt to explore basic tendencies of logical empiricists for taking philosophy into their consideration as the logical analysis of languages only.

Truly, human expression can be emotive or conative with reference to reality. But, these references do not have the merits to be true or false. Emotive language, in most part, has had immense influence on human mind; it can change the course of human life, can overshadow the motion of human credibility. In fine, it has a very little influence on cognitive domain. But knowledge or cognition depends on purely informative reality. Sibapada Chakravarti in his *Analysis and Philosophy* writes,

Just as there may be a cognitive reference to reality (facts), there may also be a cognitive reference to thought or knowledge itself. When there is such a thought of thought, thought itself becomes an object of knowledge and thus become one of the facts. Thought and reality are same if and only if we take thought to be one of the objects of knowledge i.e., as one of the facts. A treatment of such thought is psychological. Thought as knowledge, not as object of knowledge, is something different from reality and is a theoretical reference to reality. Thought is treated logically in this reference; hence logic is not a science of facts. It would, therefore, be

misleading to call the special sciences as 'special logics'. Cognitive reference is informative of reality. If we understand what 'information' is, we grasp what is cognitive reference to fact. logical thought may give true information of facts. Emotive and conative attitude do not give information, true or false.[180]

It is sometimes spoken that Japanese novelists once didn't think themselves to be successful writer unless the reader do commit suicide by reading their novel. Therefore, poem or any literary art can change human life but it has no relation with cognition at any form. To be sure, language needs to reflect the reality if it claims to be truly cognitive.

Now, we will look around the fact, how the cognitive reference to reality is expressed through language or more precisely through the construction of sentence with the use of vocabulary, phrase, and rule of sentence construction.

3.1 Language as vehicle of message

What does language contain? The simple answer is: it contains the fact or reality. Accordingly, the fact is expressed through words and sentences. How the word or sentences act for language? Again, what is fact thereby? Fact is that what really happens around us. Moreover, is there anything in the world which does not happen in any way, yet we can express it as event or fact? This is the most valuable question for which the traditional philosophers in general and logical empiricists in particular are concerned about. Traditional philosophers, especially the idealists or metaphysicians, do not care about the subjects for which they stand their ground. All the subjects of their thoughts do not stand apart from human mind. Bishop Berkeley[181], possibly the only empiricists in the world who, at the same time, holds the dual position – empiricism and idealism. But, interestingly, on the special point of judgment empiricist and idealist do not stand against each other since both of the arguments invoke subjective interpretation about the knowledge of other object. Idealist, subjective Idealist particularly, always declares that the existence of an object must be depended on my mind. Unless it is reflected in my mind I can't go for the existence of object. On the contrary, empiricists do always speak in a same tone. None of the arguments finally avow any existence of something outside of human elbow. But the basic difference between these two may be

[180]SibapadaChakravarti, *Analysis and Philosophy*, RabindraBaharati University, Calcutta,1982, p.7

[181] Berkeley is widely known for his subjective idealism and empiricism. This is a rare synthesis in history. Idealist are usually happened to be found in rationalism but Berkeley's empiricism is something different where he finally surrenders his empiricism to the ultimate reality.

determined on the ground of methodological approach for which these ideas stand against each other. Logical empiricists explore the meaning of words and sentences which are conclusively verifiable. However, it remains an unresolved issue: who will verify the statement concerning the existence? The verifier is, from their part, still unclear.

How language is learnt by the children at the outset of life? Most importantly, how a different language is got by heart by an alien language-seeker? It is taken importantly that fact is expressed by language through writing or speech. Speech, in spite of its invaluable import, is not taken as permanent vestige of human records for its transitory character. So, written language is much more important than speech. Again, we, in every respect, understand one fact by observing some sorts of expressions. So, there is a causal relationship between the particular event and its' exposition concomitantly. When we write 'black cloud' in a paper, what does it express in the reader's mind? Suddenly this very term might bring the readers to the pre-stormy atmosphere where the very situation is imprinted in readers mind earlier. So, a small mark in a white paper remind the reader of a definite reality or an event, of course, that is possible indeed by written language. In that whole case, it is importantly noticed that one is stood for the other. Schlick says, '*signify* it'.[182]

Now, come to the point of word or word-meaning that is taken to be the smallest unit of meaning; as the brick for example is as the constituent of building. Words and terms make the sentence as the basic ingredients. Suppose 'the prime minister of England is always responsible to the parliament' – is a sentence which has eleven words including two terms –'the prime minister of England' and 'is always responsible to the parliament'. Word, in fact, is composed of some letters although singular letter sometimes carries the same weight like 'a' and 'I'. It also, sometimes, takes sign and symbol to indicate some events in this connection which have an equal importance in linguistic expressions. 'V', the letter, is an expression of victory or some especial gesture of an umpire in the cricket match expresses the same thing very importantly. When the spectators of cricket match in the gallery are in a serious confusion about the run—whether it is four or six—the raising hand of the umpire suddenly diminish the suspicions. So, it is agreed that, all words have meanings but all things that have meaning are not words in that sense. It is also true that many words and terms have more than one meaning. According to the merit and status of sentence, words and terms

[182]Schlick, p.287.

are used for different reasons. 'Mind', 'look', 'weight', 'stand' among many other words is usually used in sentence for different purposes and different meaning. 'Mind your own business', 'please don't mind, if nobody request you to dance' or, 'please mind my baby while I am out' –are the sentences of different kinds where 'mind' is used for different occasion and purposes. 'God' has a different meaning to the different people in the world. Somebody treated it as the supernatural being, someone says it nature or many people in the world believed that it is nothing but a misuse of linguistic terms that weighs nothing. So, words are sometimes used for many purposes at the same time.

How people of different locations ascribe the same attribution and meaning to a single word? This question is very long and the historian may seem to speak clearly about the origin and uses of word. Is it true that people sat once in human history and initiated to get round in exploring the meaning of different words together? Did they come in the line for mutual understanding and make a consensus to call the same thing by the same sound of a word? Suppose, the word "cat"—is called "chat" in French, and "Katze" in German. Did you and I establish the meaning? No. When did it in human history? We don't know actually. We only come to learn in our childhood that this very animal is called "cat" irrespective of time and space. What I mean by the word cat very precisely, do expect that the people of different parts indicate the same animal whatever the language may be. A French school boy by showing a cat may say, it is "chat" but the English boy calls it "cat". They are finally indicating the same animal even though they are pronouncing different words at the same time.

Some linguists opined that language must follow the convention which once established. Nobody can say now that, 'this is a bird' by showing a "cow". What is wrong with that? I think there would have been no problem if all the people in the world are agreed upon with the stipulation that they will replace the meaning of the sound of "bird" and "cow" with each other. If anyone asks you, why do you call it cat? Everybody will say that, it is "cat" so I call it cat. When two people come together of two different languages and by showing cat: one shouts oh! --this is cat. Another says oh! -- this is Katze. They are actually implying the same object with their different noises. But, if this is happened alternatively; anyone indicates it as "bear" instead of cat! How disaster may take place if it persists to happen in human society? Fortunately it never occurs in human history. Why this is not happened? This is not happened because there is a silent understanding and mutual correspondence among the language-speaker

especially about the meaning ascribing phenomena. So, this can clearly be said that language is mostly spoken by following some convention. Hospers says, 'the relation of word to its meaning is in some ways like that of a label to a bottle. The label tells you what is in the bottle (if you are able to read the label), but it has no natural relation either of causality or resemblance to the contents of the bottle.'[183]

Now, if a new word is discovered by any nation or a new word is suddenly incorporated in a language, what happens then? This may happen in any language at any time. In that very situation people may not ask to the user: how and why the word is discovered in the language; instead, he may welcome the word by knowing its meaning. So, the important thing here is to remind us that language is mostly conventional.

Now let us think how words are used in a sentence to make it understandable. We in most cases never use a single or isolated word and phrases to express something to others. Suppose a sentence-- 'democracy is the best paradigm that brings happiness to the people'—where every word is taken according to the rules of grammar, so it expresses the meaning. On the other hand, suppose 'Sunday lefts blue where'—is a sentence where every word has a specific meaning, however it expresses nothing. It expresses nothing because it does not follow the grammar. Accordingly, linguists set up rules for every language in order to operate meaningfully.

We need to make a distinction between sentence and proposition. Sentence has a meaning i.e. it express a fact. But, sentence can be expressed in different ways. Like, 'Mr. Russell is two years senior to Mr. Moore', and alternatively, 'Mr. Moore is two years junior to Mr. Russell', are two different sentences which express the same information. The structures of those sentences are different to each other but interestingly there is no difference in the merit between these two. It means, the same information can be expressed through different propositions. It reminds us that proposition can always be true or false. Hospers says, [A sentence is only a vehicle of meaning, and only when we know what that meaning is can we know whether the proposition it expresses is true or false. A proposition has, indeed, often been defined as "anything that is true or false"][184] . So, we inevitably come to a debate: 'do propositions

[183] John Hospers, *An introduction to the Philosophical Analysis*, Allied publishers Private limited, 1971, p.5
[184] *ibid.,* p.78.

exist before anyone states them in a sentence?'[185]. Or, it may be asked thereupon, what is the difference between the sentence itself and the meaning that it conveys.[186]

Language, which is widely used by people, is of different kinds. Informative language among those is very important for which the logical empiricists are concerned about. Moreover, emotive, optative, interrogative, interjectional, hortative etc. are also in vogue for human uses. Informative language is always expressional which advocates speaker's state of mind. Only informative language is connected with knowledge or thoughts. Some expression like 'snow is white', 'the prime minister of England is a male' are describing some facts eventually that are taken to be informative. So thought and language are virtually identical. But the question is still very important, aren't those expressions important other than informative language?

3.3 Meaning and verification

Schlick says, 'the object of every proposition is to express a fact.'[187] So, if we want to explore the meaning of the proposition it needs to justify the fact what it expressed. When we ask someone, what do you mean by the term? It usually means that we are just expecting an elucidation of the term that seems to be easy and understandable. It is mere repetition or translation of the term only in other words. It also indicates that we don't understand the first term but understand second one.

2.3 Experience and knowledge

We need to end up a serious debate which brings us at an important phase of discussion: which experience in human life can truly be expressed as knowledge? In addition, we are now tempted to enter into a huge program that may help us to make a bridge between experience and knowledge. Let us see some experiences which are really confusing in character:

a) Macbeth waits. His imagination begins to work and he sees a visionary dagger hovering around head. He tries to seize the dagger by his hands, but can't do so. He asks himself: whether it is a "dagger of the mind" or "a false fevered brain" of that moment. When people sometimes groan with the increase of body temperature and feel dizzy; it sometimes brings mental havoc.

[185] *ibid.,*
[186] *ibid.,*
[187] Motitz Schlick, *Philosophical Papers*, p.309.

b) When we use to roam at the bank of river in a moon-lit night what does happen? We must notice that the moon seems to be, also, moved away with us towards our destination. What exactly happens there? It is nothing but a false-perception which is, in effect, perceived erroneously.

c) Sometimes in the dark night people scream with fear by assuming snake across the road. But with the appearance of sufficient light finally it appears to be rope.

All examples of human experiences are private. These are private because when these experiences are encountered objectively virtually produces nothing. An experience which is privately sensed confined within oneself does not have a characteristic of public enterprise is called private experience. This is commonly assumed that private language is closely connected to private experience. Private experience, therefore, is an experience which is usually thought to be most inalienable mental provocation. It is called private because it is devised to enable a small group of people to communicate with each other which is mostly unintelligible to others except them. The detective branch of police or military intelligence group does use their confidential code and it is strictly forbidden to public. Shorthand's writings and especial code or password for the warriors in the battle field is considered to be private language.

However, it is not, strictly speaking, private because it is structured in such a way that it must be comprehensible at least to the people within the group. Having been experienced of that language people does their functions within their stipulated project very secretly. So, the above terms are very much important for making the significant communications. Every process in making significant sense these terms work together and do function invariably. But in spite of their congruent workability it can never be told that they do justice to the observers properly. So, the question may there be asked, 'haven't our experience got the public appearance?' Or, more precisely, 'can there be private experience?' Most importantly, it needs to see through the relation between experience and knowledge. Ayer writes, 'For it is often, held that for a language to be public it must refer to what is publicly observable: if a person could limit himself to describing his own sensations or feelings, then, strictly speaking, only he would understand what he was saying; his utterances might indirectly convey some information to others, but it could not mean to them what it mean to him.'[188] Carnap names it protocol language.[189] But protocol language is only applied solipsistically.

[188]A.J Ayer, *The Concept of a Person* ,Macmillan and Co. Ltd. NY. 1964. p. 37.
[189] Direct record of one's experience is called protocol language.

Carnap makes it clear that protocol language is a part of physical language. So if anyone wants to understand another's protocol statement It is possible on the ground that physical language is inter subjectively verifiable. How people express their experience and try to make out the exact feelings to others? There is, obviously, something lies beyond inter subjective communicability. When a child in his early life learns to have a taste of some food like sweetmeat or bitter gourd; he learns the taste of it from his parents. It is rather interesting that, the entire learning process depends on some hypothetical assumptions that make a bridge between a knower and apprentice. How do people reach a consensus that 'sugar is sweet', 'quinine is severely bitter', 'green mangoes are sour' etc.? All the tastes are personal or private; in spite of that, irrespective of time and space people express the same experience and not otherwise. When we use to take a cup of sugar beverage at the family reunion each of us surely expresses the same taste or experience during the time of drinking. Why does it take hold of same taste? Why the people are found exposing the same feeling and same mental state during the time of taking the same thing. It is never seen otherwise to have different sign in their face while they are having same experience. Does it happen otherwise when people in a same party express their different opinion concerning the taste of a same food? When our senses are allowed to interact with the external world it normally occurs to have the same for all people under the same condition. If the senses are sound and happens to be the same conditions all around, nobody would expect the different results from the events.

Learning is a process which depends on the approbation of human agreements. Suppose bitter, sour, pain, sorrow, ecstasy, despondency, are the human feelings that are extremely personal, however, we are able to understand other's pain or sorrow. How can we understand other's pain? One may reply that, it is very simple because he is conceding himself his own experience so he is in pain. Pain, here, is actually assumed from the analogy of facts. When learning is once finished everybody could understand others by his own experience. If we find some sugar lacks sufficient sweetness it never implies that *sugar is not sweet,* it is usually thought that this particular amount of sugar contains adulteration. How can children learn to make the difference between sweet and bitter? It normally happens that, at the outset of learning children were given a lump of sugar or a piece of ripen mango and convince them for the special taste as sweet. This is the first experience of sweetness by which children can able to have that. They must learn the experience from the convention which is agreed upon to be 'sweet' or 'sour'.

Russell finds two interconnected merits of language: 'first, it is social, and second that it supplies public expression for "thoughts" which would otherwise remain private.[190]I argue that, every experience seems to be private. But whenever this experience is expressed in language it can no longer be private because the aim of language is to communicate with others. It needs to follow the rules of language i.e. the syntax of the formation of sentence. Language consists of vocabulary and syntax. Therefore, the rules of the formation of sentence must be known to the people and these rules must have a definite structure. However, for the case of private language it is always found to be arbitrary and the deduction from which it is brought does not follow any rule.

If it is saidthat 'this boiling water is hot' or 'that piece of snow is cold' what does it mean? It means that everybody is more or less agreed upon its hotness or coolness if the senses are found to be sound. Likewise, the language of umpire in cricket match is same to that of the symbol of traffic light. This is mere a sign of some events which imply something beyond the occurrences. All we have agreed to go by the meaning of red or green light in accordance with the convention. Red light or green light has no definite meaning for itself and it is completely meaningless either, if we do not inscribe the meaning on it. Accordingly, the experience of these events is also private but it becomes meaningful whenever it works as per the agreement of people.

Ayer points out two important conditions about private language: a) that for a person to use descriptive language meaningfully it is not necessary that any other person should understand him and, b) that for anyone to understand a descriptive statement it is not necessary that he should himself be able to observe what it describes.[191] In addition, he also thinks that, it is not even necessary that he should be able to observe something which is naturally associated with what it describes, in the way that feelings are associated with their 'natural expression' [192] Lastly, he does not think that it must be necessary condition for our understanding to *observe* what other describe. What is otherwise then? He clearly makes his position that any descriptive statement should be, in some way, verifiable. But in some way it needs not to be verifiable by me only. I think Ayer starts a serious debate over the issue of verifiability, especially verifiability by whom?

[190] Bertrand Russell, *Human knowledge,* Rutledge, p.73.
[191] Ayer, *The Concept of a Person*, p.51.
[192] *ibid,* p.51.

3.4 Experience and its objective nature

It is undeniable that all experiences are conclusively private. It is private in the sense that there is a long complicated psychological process which solely depends on human physiological function and its integrated correspondence. The experience of anything cannot transfer to anyone during the time of occurrences. Russell says,' language is a means of externalizing and publicizing our own experiences.'[193]Every people are responsible for their respective experiences. It never happens that one can be able to transfer his particular sensation of red light to others who is blind by birth. However, it does never take a subjective shape following finishing up with its courses. 'I see a cuckoo at the top of my house', for example, is a case of very personal sensation but when everybody of my house comes out to see it and concede it to be cuckoo thereafter, there might be no disagreement among the members of my house about its acquaintance. It usually never happens that someone identify it as crow or sparrow. For the case of a tiny member of my family who is yet to be acquainted with this special species of bird may shout suddenly by saying it as crow! It is nothing unnatural for him to identify it as crow because his experience with the language is yet to be bridged up. Therefore, language needs to reflect reality for successful correspondence.

Learning of language depends on two important ways. One is *verbal definition*[194] and another is o*stensive definition*[195]. A word may be learnt in terms of other words and this process depends on definition. 'Arthropod', for example, is a group of animal which has a segmented body having a strong skeleton. If this is said that *it is a lobster* it means that it has got very properties of Arthropod. When we learn to be acquainted with a new term, like lobster, we actually depend on some verbal definition until we reach at the last point which it is referred to. Other process is more efficacious which just refer to the objects or events directly. When we start teaching our baby with many new events or terms around us like 'football' 'computer', rain', 'sun', 'moon', 'storm' or 'dinner', what do we mean by that? What do we usually mean by that? During the time of raining we just tell them, ' it is called rain', or showing the shimmering nugget in the sky

[193] Russell *Human Knowledge*, p.74.

[194] Verbal definition is used to recognize or to make out the term verbally. It is expressed in spoken rather than written words. At the outset of the learning, in most of the cases, verbal definition is used as a contract.

[195] It is the meaning of a term by pointing out examples. It is often used where the term is difficult to define verbally. When the words are not understood verbally because of the nature of the term color, sensations of different kinds for example, ostensive definition has no alternative to make out the term clearly. This definition assures the questioner to recognize the type of information being given.

at noon we say them 'it is called sun'. No child can learn anything at the outset of his life by verbal definition. 'Consequently the meaning that the child comes to attach to the word is a product of his personal experience, and varies according to his circumstances and his sensorium'[196]. Every language needs to refer something which must be conclusively referential to be meaningful. 'I am seeing a cuckoo' and ' I am seeing a ghost' are the statements which do not have the same meaning to the observer since the case is non-referential for the later statement. Nobody believes in ghost. Why do they disbelieve in ghost? It seems to be an easy answer to that. Ghost is a non-existent concept which does refer nothing. When anybody of my family claims to have the experience of ghost what we usually do then? We demand to show it again. What does the observer say then? This case is not very better than a spiritualist who constantly claims to have knowledge of the mystic sort. There is a big question in philosophy and also in psychology how the process of perception takes place and in what circumstances perception may be called in question. Perception is usually thought to be private and public and it is often misunderstood for the case of private sensation. In most of the instances hallucinatory or false perception takes place for the case of private affair. Moreover, in many other cases we may stumble into our common sense believe and our senses on which we do rely dogmatically.

Empiricists categorically denied any kind of word or phrase or sentence which does not have any references to the reality. Logical empiricists reject those kinds of thoughts because they think that they don't subsume knowledge to human cognitive domain. The hypothesis of scientific works has a necessary reference to the empirical functions and it always justify or prove the veracity. Therefore, scientific propositions are entirely critical that invokes experiment and observatory expedition. On the contrary, ontological supposition also claims to interact with experience that is unlike to ordinary experience. This especial account of experience is termed as *occult experience*[197].Schlick unhesitatingly points out that, 'the Meaning of a Proposition is the Method of its Verification.'[198]This decisive turning point makes a serious dilemma for the positivists because no proposition about any reality of the world is capable of being verified exhaustively. Even though it is commonly assumed that all scientific

[196]Russell, *Human Knowledge Its scope and Limits,* Routledge, London, p.17.

[197]Sibapada Chakravarti, *Analysis and Philosophy*, p.41.
[198]Schlick, *Philosophical Papers*, p.311

propositions are capable of conclusively verifiable but modern science does not hold this postulate entirely. Even it is not factually possible to verify outwardly all the theories of scientific hypothesis. The induction on which scientific theories are, in most part, built upon does not guarantee us to be examined in a similar vein. Therefore, the principle by which the positivists got the run of their project falls in a serious setback.

The question is much more important which we sometimes face in our daily life. The meaning of sentence does not always depend on its literal meaning. Sometimes, words which are used in sentence do not carry the exact meaning by which it is constructed for. Suppose, 'M.N. Roy was arrested by the police while he was underground.' I do not think anyone can believe that M.N Roy was beneath the earth when he was arrested. Everybody I think translate the term 'underground' as 'absconding'. So, the meaning of words sometimes refers to another words or events that may create confusion among the people. Moreover, philosophers in many cases make the difference between 'meaning' and 'referent' in order to avoid confusion among the language speaker. Suppose 'the prime minister of Bangladesh' is a term that refers to a woman. But its meaning is not that woman. What does a sentence actually express is that of its meaning but it obviously refers or indicates another thing. If it successfully do that we call it 'truth' or if fails we call it 'false'. Russell writes, 'the basic propositions must be derived from experience, and therefore propositions which cannot be suitably related to experience, are neither true nor false.'[199]

This is clearly advocated that every proposition is conclusively determined by its verification. It sounds very implausible because there are many words in languages which do not have factual existence. Mathematical sign and symbols are the best example which in turn entirely abstract in nature. It only tries to construct and build up relations between two concepts. Suppose $(a+b).(a-b)= a^2-b^2$ or $T \vee T=T$ are some mathematical equations which express some reasoning. These are entirely abstract in form and content. In addition to that, we use many words for our practical purpose during sentence construction like "have", "if", "best", "or", "then" and so many words along with innumerable phrases for meaningful understanding.

[199]Russell, *An Inquiry into Meaning and Truth,* Routledge, 1992,p.289.

Over and again, some people ask about the business of philosophy: if philosophy does not think about the removal of human confusion through critical analysis, what then is the function of philosophy? It obviously precipitates into the realm of analytical domain where we can't think philosophy destitute of logical analysis of expression and statement.

4.

LOGICAL EMPIRICISM TOWARDS METAPHYSICS

The essential business of philosophy, logical positivists believe, is to introduce a logical method by which they think it possible to eliminate unnecessary tosh and galimatias from our cognitive activities. Metaphysics, outwardly, express nothing because they believe, '… that metaphysical statements are meaningless strings of words, that they are sentences which conform to the rules of grammar but are lacking in literal intelligibility, even though they may arouse strong emotional reactions in people.'[200]Despite the fact that scientific propositions are not altogether conclusively verifiable however it is taken to be meaningful. So, it makes a clear paradox for the empiricists, what should be the basic point to make a clear distinction between metaphysics and physics? The question comes round in history with different feedback by the empiricists. The attitude of the positivists and their methods towards metaphysics, I think, fails to take hold a clear position from their part.

Before going in detail I should mention an important essay of Karl Popper about "the demarcation between science and metaphysics" from his *Conjectures and Refutations: the Growth of Scientific Knowledge.*[201]This is an essay which is supposed to be a follow up discussion between Popper and Cranap held in 1932 amid beautiful environment near Tyrolese Hills. Popper remembered that finest moment along with Herbert Feigl, another, vital member of Vienna Circle. He remembered the happy moment with Carnap who, according to his language, is a captivating person with much more devotion having extraordinary quality to listen to criticism. Popper seriously thinks about two fundamental problems of epistemology. One is about induction and another is the demarcation problem between science and metaphysics. I will discuss very briefly about the Popperian stand which I do not accept for a good number of reasons. Popper actually questioned about the method of science where he maintained that modern science in most part depends on *speculative method.* So, 'pseudo-sciences and metaphysics are characterized by speculative method'. He thinks that Einstein's theories along with

[200]Morris Lazerowitz ,*The Structure of Metaphysics*, Routledge and Kegan Paul, London, p.29.

[201]This is an essay which is supposed to be a follow up discussion between Popper and Cranap held in 1932 near Tyrolese Hills. Popper remembered that moment along with Herbert Feigl, another vital member of Vienna Circle. He remembered the happy moment with Carnap who, according to his language, is a captivating person with much more devotion having extraordinary quality to listen to criticism.

many others are highly speculative and abstract in nature. Further, he has given so many examples from history where he claims that many scientific inventions have been taken place with *mental anticipation*. So, all attempts to show that they are more or less directly 'based on observation'[202] were unconvincing, he claims. Accordingly, he proposes *refutability* or *falsifiability* should be taken as the criterion of demarcation. I think Popper's new theory is completely unconvincing for at least two reasons: a) he ignores the nature of science; b) he ultimately brings science in an anarchic realm.

Logical empiricist does make no bones about any possibility of transcendental knowledge which is claimed by metaphysicians. So, they come up against metaphysics in order to square the circle. In spite of having especial tactic to save many scientific propositions from the imputations of non-verifiability; anti-metaphysicians could not finish their huge job squarely. All their preparations have to face tough challenges from their counterpart. So the history of anti-metaphysics does not get a good riddance from accusations of different setbacks. I will oversee the whole arrangement and bring up to the rear that if science would have to shrug of metaphysics from its true cognitive functions it needs to pay high price in effect because many times science has to plod march amid much more epistemological haziness towards its unknown journey.

It is important to note that Logical empiricists hold almost same views about metaphysics in spite of their different positions and points of argumentation. All the anti-metaphysicians come to the same line of arguments and consequently hold alike views about metaphysics that substantially exposes the iconoclastic mode of their trends. Metaphysics, thus, is rejected by all of them for its non-cognitive functions and bad logical inferences which are finally accused of *petitionnprincipii*. For as much, metaphysics is turned down by the logical empiricists because of its mystifying character. It never follows rules of inference during the time of syllogistic approach. In addition, it is overridden by the empiricists as such that metaphysics always speak those languages which finally express nothing but sophistry and illusion. Again, 'it demands what is contradictory'[203] and finally it follows nothing while it is being encountered logically. Philosopher who demands to have knowledge of reality which transcends the physical world does not have the factual ground and thus it is believed to be devoid of any content. Kantian thing-in-itself should be the best assumption of that super-sensible area of human speculation. Kant's proposed world—'das Ding ansich' and 'die Ding fur

[202]Karl Popper, *Conjectures and Refutation*, Routledge, 1989, London, p.254.
[203] Moritz Schlick, *Philosophical Papers*, Vol. II , p.11.

uns'—fails to make the rapport between physical and metaphysical line of human ideas. Therefore, any attempt to prove the logic of metaphysics finally turns to be sterile and makes the whole thing pointless. As for them, it is claimed that metaphysics completely stand against our common sense and exhorts something which does not finally speak real. All the anti-metaphysicians, conclusively, come up with the same logical point that metaphysical utterances are neither true nor false and thenceforth those are meaningless. Accordingly, logical empiricists twist off all the sentences related to the transcendental knowledge, since it does not corroborate with the facts of our practical events. Moreover, the method which metaphysician takes hold does not cohere with the rules of inference which is supposed to be the genuine way of knowledge constructions.

Critic sometimes says that, sentences used in metaphysics are not understood only for its lack of intelligibility but 'because we simply are not cognizant of what the words which express the theories and their fortifying or refuting arguments come to.'[204] It is the very nature of metaphysics that always provoke human emotions and in all likelihood it detains human asking and suspicions. Morris Lazerowitz holds, 'Like a dream, a metaphysical theory is a production of the unconscious and both sense and motivation.'[205] It may give us ecstasy or pain, feeling of security and of danger but the thing come into prominence: how far all the suppositions confer the logical significance of metaphysical inference? He also says, metaphysics is completely pointless because the languages which are used here are nothing but the misuse of human curiosity. Metaphysician's claim to have a comprehensive world picture is quietly absurd, he thinks. An important objection against metaphysics brought by the logical empiricists is: 'from what premises his propositions were deduced?'[206] Suppose, an argument, here, is to be put forth likewise: 'All human being are selfish'/ 'you are a member of that species (human being)', therefore, 'you are selfish'. This argument is sound because it follows the rule of syllogism but unfortunately if the conclusion happens to be deduced like,: 'All human being are selfish'/ 'you are a member of that species (human being)', therefore, 'God is kind' or 'God will never be unkind' which sounds to be very ill-breeding. So, to form a valid argument for any logical deduction it must need to follow the rules that make the whole argument plausible. If then, premises, collected from this perceivable world as well as our known phenomena must ensure that the conclusion deduced from it stand for this mundane world. Or very precisely, no super-sensible

[204]MorrrisLazerowiz, *The Structure of Metaphysics,* Routledge and Kegan Paul, London, 1955, p.26.
[205]*ibid*., p.26.
[206]Ayer, *Language, Truth and Logic*, 1946, p.13.

proposition can possibly be deduced from there if the premises speak about any sensible events. But metaphysicians always fly the face of that logical coherence and assume something bizarre entity.

Alternatively, metaphysicians stand as opposed to empiricists directly. They argue that metaphysics is an attempt to comprehend the universe as a whole unlike the special branch of human knowledge: physics, Chemistry, Botany, Ethics, for example. Ethics deals with the justification of human behavior in terms of moral standard, physics on the other hand deals with nature of physical objects; but, metaphysics is a comprehensive world-view to grasp the first principle or the ultimate being of the universe. Metaphysicians believe that it is not possible to understand the reality having particular or discursive ideas about the phenomena. So, in effect, transcendental knowledge or the knowledge of highest kind is needed to grasp the whole. Sometimes in history metaphysics is taken to be synonymous with philosophy. Again, philosophers of this special kind hold that it is the only function of philosophy to explore the basic principle or ultimate cause of the world. In most of the cases, it is thought that 'metaphysics may be provisionally defined as the systematic effort to deal with human experience as a whole.'[207]They do not reject the necessity of experience as a whole but on the contrary, it is claimed to have an especial kind of experience that is called mystic. Metaphysician demands to answer such questions which are substantially unreachable to physicists because metaphysics starts, as it is often claimed, where physics ends. Metaphysics in a sense of the term denotes the knowledge of the world which is believed to lie beyond the physical world. Furthermore, it is not an easy way to gain a comprehensive world view without making an exact philosophical outlook, metaphysicians believe. Father Copleston[208], in a debate with Ayer, rejects any single attempt of the empiricists by which they try to demonstrate the impossibility of metaphysics.

It is wholly, Coplestonclaims, non-empirical. Thus, he underscores the need of extra-sensory perception or transcendental knowledge to grasp the whole reality. He finally compares the knowledge of particular science to the confined views of human progress and says, the room where we do reside is limited at every turn but it should not be denied,

[207]John Mackenzie, *Outline of Metaphysics*, Surjeet Publications, Delhi, 1997,p.1.
[208] F.C. Copleston(1907—1994) was a British philosopher and priest and eventually became friend of A.J. Ayer. Copleston debated with Russell on the existence of God in 1948. Following year he took part in another debate with Ayer on logical empiricism.

there remain a vast world beside the room. In effect, metaphysics just try to unravel the mystery and bewildering human suspicions.[209]

Now, let's consider the following section of views:

- Everything is in a state of flux.
- Nothing is unchangeable.

- Everything in the world is conditional and not absolute.
- Whatever is relational is unreal.

- Every event must have a cause.
- Causal relationship is substantially vague; everything is a part of the Supreme Being.

- Basic entities of the world are numerous and functional.
- There is only one entity that is transcendental and absolutely perfect.

- Experiences are more or less objective because they always speak about the subsistent beings.
- Mystical experiences are extremely private as they stand over against human traditional perception.

Now, let's carefully observe the above sentences. Every pair stands opposite to each other in terms of the merit. All factually grounded sentences are followed by very uncommon and impractical hypothesis. It is easily understandable that in each case the following sentences stand against our functional experience. Some of the sentences are not true and some are completely devoid of any literal significance. 'Nothing is unchangeable' is a sentence which is false because it does not support with our practical life. On the

[209]Copleston, in a debate with Ayer, says, 'I think that one must distinguish physical analogy and metaphysical analogy. If I say that God is intelligent, I do not say so simply because I want to call God intelligent, but either because I think that the world is such that it must be ascribed in certain aspects at least to a Being which can be described in human terms only as intelligent. I am perfectly aware that I have no adequate idea of what that intelligence is in itself. I am ascribing to God an attribute which, translated into human terms, must be called intelligence. After all, if you speak of your dog as intelligent, you are using the word in an analogous sense, and it has some meaning for you, even though you do not observe the dog's physical operations. Mathematicians who speak of multi-dimensional space have never observed such a space, but presumably they attach some meaning to the term. When we speak of 'extra-sensory perception' we are using the word analogously

contrary, some statements like 'There is only one entity that is transcendental and absolutely perfect' are quietly different to that of previous example. Empiricist says, its status is something which is neither true nor false. So what is then the follow up? It is nonsense indeed they claim. Therefore, the question comes into prominence: how can we understand the difference between *nonsense* and *false*? It is not exactly an easy way to cut loose of nonsense from false sentences.

When can we call a sentence false? This can flatly be coined; any sentence which does not express the fact is called false. Or, if a sentence fails to detect the exact explanation of the event it turns to be false. Suppose, there is an event *P* and the sentence which represent the 'fact' is *Q,* then, the structure of the sentence is: *P* (fact) ≈ *Q* (assertion).Obviously, if any representation does not reflect the fact correctly it turns to be false. For example, 'Ice is green' is a sentence which does not express the fact. So, this is called false; it is false because we know the characteristic of ice which is not green. It is completely agreed that ice cannot be otherwise than white so any sentence other than the fact is false. But, some sentences are really like sentences because they fulfill the grammatical rules however it express nothing. So, they are neither true nor false. They are meaningless. After all, it is clearly advocated that if a sentence is taken as meaningful it must express proposition or having capability of being *true* or *false.*

The question remains unsolved about the exact status of some crucial questions which, I think, they fail to address. For example, 'it is false that blue conception does not make a clear sense in human life' is a sentence which, according to them, is false but not meaningless because it is not a metaphysical sentence.If the above sentence is not meaningless but taken to be only false then, what is the meaning of it? On the other hand, 'it is not true that God has created the universe' is a sentence which I think, from their part, is false but not meaningless. I am sure how can they distinguish between meaningless and false sentences in order to make the so-called demarcation line. Suppose, we imagine that there are some horses in the world which have two feathers behind their neck. So the sentence like 'it is imagined that there are two-winged horses in the world' is not meaningless indeed. Likewise, if it is supposed that a sentence like 'I imagine that God is very unkind to the disbelievers', what would be its status? Is it meaningless? Very plainly it might be thought to be meaningless. But, when I say that before going to the metaphysical sentence it is added *imagine* as prefix; what would be wrong here? We can *imagine* whatever we like. We can't constrain ourselves in drawing the line of imagination. So, there should be no question of meaninglessness if I think it to be only

imagination. Similarly, I can guess that 'Bangladesh will be a country of middle class income by 2021 if the present economic flaw continues'. So, the merit of the sentence is not quietly different to that of so-called metaphysical sentences.

Meaningfulness or meaninglessness depends on the successful communication between the speaker and the hearer. It needs to have a successful rapport what exactly I mean by a sentence. If I say, 'Rob Peter to pay Paul' what exactly I mean by the sentence? It is absolutely meaningless until I successfully translate the meaning to my hearer. He may say, 'no I do not understand by it what exactly it means.' I need to describe then the situation by using synonymous and the references on the exact point. When I say that it means 'snatch a thing from one and give it to another' then my listener becomes comfortable in making out the meaning.

But the case is not always conducive to the hearer especially when the speaker expresses inward state of mind. If the listener does not have any similar experience like the speaker this is absolutely impossible to translate the feelings to others. The whole thing turns to be meaningless to the listener however it takes to be. Suppose a sentence like, 'intellectual exasperation enchants me'. I am not sure whether a man can understand the exact meaning of the sentence if he does not have similar state of exasperation. If it is said, 'what do you understand by the fact that heavy objects flows uphill?' The simple answer is, 'I mean heavy object defies the gravitational force and flows upstairs.' This becomes an anti-law of nature so it is false if not meaningless. But, 'Friday usually does not take rest' is not false only but meaningless. Paul Marhenke says, '… The criterion of significance amounts to the assertion that a sentence is significant (meaningful) if it is possible to formulate another sentence which is synonymous with the given sentence.[210]

Regarding scientific proposition we are not sure enough that they alwaysseem to be meaningful according to the rigid criterion proposed by the positivists. In many cases it becomes impossible to make distinction between physics and metaphysics. Historically, science proceeds through much epistemological haziness. Science, of course, always explores the truth but on the way of exploration it turns down rigid logical method. It is not always sure that the truth which has unveiled the nature so far does not guarantee to be final and unscathed. Thomas S. Kuhn in his *The structure of Scientific Revolutions* has described historical development of science and sociology of scientific knowledge. He

[210] Paul Marhenke, "The Criterion of Significance" in Leonard Linsky (ed.), *Semantics and the Philosophy of language,* p.150.

argues that normal science in history is often interrupted by revolutionary science and the "anomalies" during revolutions leads to a conceptual framework, which is called paradigm. New paradigm explores limitations of its previous one through puzzle-solving and tries to change the "game" and "map" for further research. The theory of Copernicus, for example, about the planetary distribution in solar system was immature at the initial phase but appealed to the researchers to make further progress of the theory in the future. Scientific progressions in history have been remarkably overridden by the successive theory every so often where a theory is replaced by another. So, a scientific theory of many kinds in spite of its maximum acceptability becomes limited and unacceptable to the further scientists. This is a usual phenomenon in the domain of physical world. The best example in physics might be the case of Newtonian classical physics and the theory of relativity.

Now, I will discuss three important empiricists in positivistic history who did follow different ways and formulate various methods to accomplish their task.

4.1 MOTITZ SCHLICK (1882-1936)

Fredrich Albert Mortiz Schlick is an exceptional German philosopher who is mainly acknowledged by his contemporaries as a mathematician and a physicist. He graduated under the supervision of Max Planck on the physics of light[211]. So, he had an extra passion for scientific philosophy especially for its method and approaches towards philosophical problem. He wants to establish a firm basis for philosophy like science in order to redress the gap between science and philosophy. In addition, he seriously thought about the foundation and possibility of human knowledge. Henceforth, he is credited as a scientist and a philosopher of science equally with much more exception.

Friedrich Waismann speaks about his nicety of judgment,: 'To be sure, it is empiricism in a wholly different form, matured and refined by the spirit of modern logic.'[212] He was a dismemberer and divider having extraordinary analytical talent. It is noteworthy, logical empiricism developed as an empiricist movement in the tradition of Hume and

[211]Schlick's thesis was about the nature of light whether it able to travel continuously through the inhomogeneous medium or whether it occurs only if the change in the optical properties of the medium is discontinuous.

[212] Friedrich Waismann, "Foreword" in the *Philosophical Papers* of Moritiz Schlick, Vol. II, p. xv.

Mach via Russell and Wittgenstein, however, the movement of neo- Kantianism and neo-idealism via Hilbert and Einstein influence much more than many thing else.[213] Furthermore, Schlick's serious work on the relativity theory, *The Philosophical Significance of the Principle of Relativity (*1915), inspired the whole system to a turn and, that is finally culminated at the position which he has expressed in the *General Theory of Knowledge.*

Schlick's work has serious limitations[214] but his inspiration to the twentieth-century thinkers is remarkable from every respect. He is not a logician as great as Frege or Russell but, I think, his basic philosophical trend towards scientific philosophy surpassed many contemporary philosophers during the heyday of empirical tradition. Friedmann says, 'Schlick never developed the habit of formulating philosophical views and arguments with what we would call logical precision.'[215] However, his contribution to mathematical, physical as well as philosophical field is invaluable. Friedmann, , says,

> For he has both a wide-ranging synthetic sense and a remarkable ability to get to the heart of a matter. He clearly perceives the broad outlines of the philosophical, physical, and mathematical currents whose convergence resulted in the development of logical positivism, and he struggles honestly, acutely, and courageously—if not always coherently—with the intellectual stresses and strains produces by this convergences.[216]

Schlick's entire philosophic career can be divided into three stages: firstly, his early thoughts up to 1924 when he had already joined at Vienna; secondly, the very position reflected in *General Theory of Knowledge* in 1925, and lastly, his later works from that time onwards. Before coming to the pure epistemological discourses Schlick deals with a good number of philosophic problems like the meaning of life, poetry, and the actualization of human effort. The important phase in his life is explicated in different writings including *Space, Time in Contemporary Physics* published in 1919. Schlick, possibly, becomes the first man in philosophy who recognizes the philosophical significance of the theory of relativity. He, here, stresses the need to draw a line of symmetrical exploration between psychology and physics in order to have a solid foundation of human cognition. How human knowledge, knowledge of particular

[213] *ibid*.,p.19.
[214] Michael Friedman writes about the *Philosophical Papers* of Moritz Schlick in his *Reconsidering Logical Positivism, Cambridge* University Press, 1999, P. 17.
[215] *ibid.,* p.18.
[216] *ibid.,* p.18.

physical objects especially, is related to physiological construction becomes his prime concern. It has obviously, Schlick thinks, got a relation with these two branches of knowledge. He, therefore, explores psychological source of the ideas of space and time and tries to reconcile the intuitive with physical space and time. He strongly holds, 'there is no doubt that all our perceptions of space, and the conclusions of resulting there from, emanate from the certain properties of our sense-impressions, viz. from those properties which we term 'spatial' and which do not allow of closer definition: for we get our knowledge of them only from direct experience.'[217]Schlick's position at this stage is very clear: why does he take to the position of empirical philosophy? Waismann explains,

> His [Schlick] elucidation of the problem of how physical space and time are connected with the intuitive space of experience is among his most important achievement—an elucidation to which even later he had nothing to add. Here his empiricism is already in evidence, in his polemic against Kant, who notoriously saw in mathematics a system of synthetic judgments *a priori*.[218]

He has made the difference between knowledge or cognition and acquaintance or experience of the immediately given. Acquaintance with the object does not yield knowledge of any kind because knowledge always involves some complicated physiological and conceptual judgments that are being furnished by human mind generally. It involves 'subsumption under concepts' [219] but it is not like the very ideas of Russell's knowledge by acquaintance[220].

Until 1918 Schlick, in a very strict sense, was not a positivist; his views can best be described as a structural realism.[221]. In all likelihood, he moves away from these views by the influence of modern physics and mathematical philosophy. With the advent of new physics Kantian synthetic *a priori* judgment, which was once victorious, lost its

[217] Moritz Schlick, *Space Time in Contemporary Physics*, Dover Publication, INC, Mineola, New York, 1920. p.90.
[218]Waismann ,"Forward", p.xix.
[219]Friedmann, p.19.
[220]Russell's theory of Acquaintance can best be understood by the way that: all propositions which I want to understand must need to be composed wholly of constituents with whom I am acquainted with. It needs to remember that the constituents are particulars and universals. Lastly, it needs to be acquainted with all the constituent of any given propositions what I want to understand.
[221] Structural realism is a form of realism which takes hold of unobservable entities posited by scientific theories. This theory was first introduced by John Worrall at the turn of 1990s. Worrall accepts neither standard scientific realism nor anti-realism. He advocates in favor of structural realism as saying that as an epistemic pursuit we only accept mathematical or structural content of scientific theories.

importance with numerous objections from their part. Kantian synthesis was seriously upset by new mathematics and physics for as much Einstein's work on the relativity theory become champion.

It is mentioned earlier, Moritz Schlick as a nucleus of this movement does not seek any alternative knowledge-function other than experience or experience-like phenomena. He believes that experience should only be the source of human knowledge. In effect, he flies the face of other sources of knowledge like reason, authority, or any other sources from which the philosophers claim to have knowledge. He, at the outset, makes the distinction between genuine problems of philosophy with the traditional problems. He, also, clarifies the need to get the bottom line of the problem which is seldom investigated by the earlier philosophers. In a lecture titled*A New Philosophy of Experience* he has knocked the bottom of non-empiricists arguments from different points of view.

4.2 PHILOSOPHY OF EXPERIENCE[222]

Schlick, in his essay, stresses the need to make the distinction between the problem by which we are being confronted with our daily life, of science and, of course, philosophy. Before that, we need to make sure of the nature of the problem for which we are going to deal with. He makes the distinction between two kinds of problem: one is scientific or ordinary and another is metaphysical. Ordinary or scientific problem, according to him, is quite different from that of metaphysical, because metaphysical problem can never be netted within the frame of experience. He has given a good number of examples to demonstrate the possibility of those sentences. Schlick has taken at least eight statements of different merits in this connection that needs to be examined:

a) When will the depression end?
b) What did Napoleon do on January 2, 1800 at 5 o'clock in the afternoon?
c) What was the earth like a billion years ago?
d) What is the substance of a distant star?
e) Is the universe finite or infinite in space and time?
f) What is the relation between mind and body?

[222] Moritz Schlick's lecture of 1932, Stockton, Calif., 1932 [Moritz Schlick : *Philosophical Papers*Vol.II (1925-1936), edited by Henk L. Mulder and Barbara F. B. Van De Velde-Schlick, D.Reidel Publishing Company, Dordrecht: Holland/Boston,U.S.A, London: England, p.225.

g) Have animals' consciousness?
h) What is the essence of Reality?

Before going in detail it needs to clarify, according to Schlick, which questions are answerable and which are unanswerable. The above eight questions are different to each other; however, the last one is quite different from those of the seven in every respect. Schlick claims to justify those questions from the experimental point of view. Just go back to the first question, when will depression end? He says, none of us knows clearly the answer. Why this is impossible to get the exact answer? It is impossible to give the answer right off because it needs to be awaited to have a clear picture of this development. So, he says, the answer will be known in some future time. He says,

> 'Most of us also believe that if there were someone who really knew all the facts and had the ability of drawing the proper conclusions he would be in a position to answer this question even now. This means that we do not regard such a question as unanswerable. We do not happen to know the answer, but we believe that the finding of it is in no way beyond possibilities.'[223]

The question here becomes very pinching when Schlick says about 'we believe' and 'beyond possibilities'. The term 'we believe' sometimes lose its impersonal connotation and as criticized thereby. In addition, the possibility of human cognition and its limitations are actually immeasurable. So there have been confusion among the epistemologists, how can human being trace out the extension of knowledge and its possibilities? However, the question, in great part, is related to human experience because its answer in no way stands beyond human cognition.

The second question is obviously related to the historical fact. It is also very difficult to point out the exact time on which Napoleon did his particular job. Accordingly, it is exactly possible to trace back those events though there have not been any written documents whatsoever. Schlick writes, 'it might happen to be known, but probably is not known; it is also possible that no historian as long as the human race exists will ever be able to answer the question definitely.'[224] From certain point of view, it may seem unanswerable. But finally he does not think such question meaningless. He further asks, 'there may be no means, as far as our human possibilities go, of ever finding out what Napoleon did at that moment. But although in one sense of the word this question is

[223] *ibid*., p.226.
[224] *ibid.,*

perhaps unanswerable, we do not get excited about a problem of this kind; the impossibility, it should be impossible to solve the problem, is not of very serious nature, because it would not be an intrinsic impossibility. It always remains possible, e.g., that a document might be found which tells us what Napoleon did at that particular time, or from which it could be inferred in some indirect way.'[225]Schlick is not incorrect in a sense that presently what we are doing in our daily life might not have been unrecorded if we do have a very good video recorder. After hundred years or so if anyone is asked to unravel those routine recorded safely would have been possible to find out every deed.

Third question is quite different and difficult indeed since it entails on our scientific knowledge that is not an easy way to make its solution. Schlick agrees, this is a question of geology. But modern science advances towards more accuracy. Therefore, astrophysics or other related branch of modern science can take the responsibility to find the exact structure of this planet. Now, according to Schlick, this is also apparently held to be difficult to give the precise picture of the earth but finally it is not unanswerable anyhow. He expects, 'we are able to make many reliable statements about the development of planets like the earth or about the stars in general; and yet our present science has not developed far enough to tell us exactly what the state of the earth must have been a billion years ago.'[226]

Fourth question is also of science. French philosopher Auguste Comte who was the exponent of positivism did not believe in human ability to be able to know the substance of a distant star. But, modern science, Schlick claims, is now so advanced that it is not impossible to know the physical conditions of distant stars including sun. He says, 'nowadays we have spectral analysis which allows us to make very definite statements about the chemical elements and their physical conditions which form the material of suns that are thousands of light-years distant from the earth. That is a good example of a problem that was pronounced insoluble by a leading philosopher, but was, only a short time afterwards, completely mastered by science.'[227]

Fifth question is very typical and more complicated philosophical issue from every point of view. It occupies a great part in Kantian philosophy because modern physics deals with such question that is still in serious trouble. He believes that the 'universe

[225]*ibid.,* pp.226-227.
[226]*ibid.,*p.227.
[227]*ibid.,.*

must be finite in space and time'.[228] On the contrary, he believes that the 'universe must necessarily be infinite in both respects.'[229] However, modern science has clarified the idea that the universe is finite in space. It is now very well established theory in physics that the universe had a starting point from where this big universe comes into being near 1.4 billion years ago. It comes from a big explosion with an extreme hot and dense state and constantly expanding by its gravitational forces. So, the question about the infinitude or finitude of the universe is not unlikely to be meaningless.

Another purely philosophical question about the relation of mind-body problem has struck Schlick immensely. Mind and body are two distinct substances which have a different logical import. It becomes a great debate in modern philosophy: which one is subordinate to other? Descartes perhaps initiates the debate about the mind-body relationship and constructs an epoch-making theory of interactionism. Modern science, physiology more especially, concerns about this particular problem and gives a nice solution about the mind- body relationship.[230] Finally Schlick explains, 'well known writers have pronounced a definite *ignorabimus*[we shall never know] in regard to the question how the gulf between mental and physical processes can be bridged, while others have thought they could get rid of the problem easily enough by way of some dogmatic metaphysics.'[231]

Have animal consciousness? This typical question is also answerable. Some philosophers agree that in many respects dog is like a human being. Descartes, however, does not believe that animals other than human being might have consciousness. He holds, animals are automata because there behavior is regarded as mechanical reaction to certain stimuli. It is exactly, Schlick holds, impossible to figure out other mind's consciousness because' we cannot have any immediate knowledge of the mental states

[228] *ibid.,*
[229] *ibid,.*
[230] It is sometimes thought that mind and body are two distinct properties where it interacts with each other, Descartes thinks, mind and body can exist separately. He also believes that it is body which causally affects the mind; on the other hand mind could casually affect body. This is called interactionism. Obviously, there is a gap in Descartes theory. Spinoza finds the gap and says, thinking (mind) and space occupancy (body) can be the characteristic of one and the same thing. Philosophers hold that it is one way causality, where body affects mind is called epiphenomenalism. Epiphenomenalism is one half of interactionism. Perhaps, P. F. Strawson has presented the very important theory in this connection. He thinks that since mental and physical are the attributions of a person so person is the 'underline entity' who has both of the characters. This is the way where the person theory of mind-body relationship is developed. I think modern theory of psychology is much more advanced.
[231] *ibid.,* p.22.

of other.'[232] He further approaches, ' there is no way of becoming immediately acquainted with any soul except our own, and so the problem of the existence of mental life in our fellow beings or indeed anywhere else seems to be a typical case of those questions the answers to which we shall never know.'[233]

The last question mentioned above is quite different from the other seven questions. 'What is the essence of Reality?'—this is a purely metaphysical question that exhorts some sorts of ambiguity. Nobody is sure enough what does it imply and how it makes the complication for the entire issue. Kant's, 'thing-in-itself' for example, is unknowable and 'most of the older philosophers seemed to have little difficulty in solving the problem.'[234] Philosophers do not agree about the nature and function of Reality. It is consequently held to be very difficult and nobody is agreed to make a solution of all the problems. Now, I will categorize those statements according to the criterion of justification. Schlick asks, 'what is the criterion by which we decide whether an "insoluble" problem belongs to the first or the second group?'[235]. He makes further assertions, 'all the questions that can in principle be answered (including those that may at any one time or place be technically insoluble) are always answerable in one way, namely by reference to some *observation* (be it of nature or of ourselves) or by any scientific method which always presupposes observations, i.e., the occurrence of some sense impressions—in short, by *experience*'[236]

It is assumed that Schlick has classified those categories of questions into three groups: a) direct answerable, b) answerable in principle, and c) unanswerable of anyhow. Proposition, according to Schlick, is an answer to any question. But in order to grasp this proposition we must need to comprehend the circumstances that would make it true or false. Here, circumstances refer to the 'facts of experience'. And therefore, experience decides the veracity of the propositions—whether it is true or false. Finally, he makes the judgment about the acceptability of the proposition as, 'experience 'verifies' propositions, and therefore the criterion of the solubility of a problem is its reducibility to possible experience. A question is 'good' one if we can indicate the way

[232]ibid., p.228.
[233]*ibid.,*
[234]*ibid.,*
[235]*ibid.,* p.230.
[236]*ibid.,* pp.230-231.

to its verification by possible experience – although, for some practical reason, we may be unable to follow that way. [237]

Here, some of the questions are really complicated and discomfiting for the empiricists like Schlick. Many questions about the principle of nature do not exactly fit for the justification of all those questions precisely. Modern physics, for many years, has been exploring the minuscule particles in the small area of the universe which they are not sure enough to trace it back; however, they do not reject the possibility of their existence in spite of some apparent incongruity with possible human experience. For all, Schlick's answerable question often stumbled by some actual facts which do not directly lie in human experience.

Some problems are seemingly difficult; however, finally it is answerable at least in principle. Some are historical and others are technical. Historical statements do pose something to be unverified in nature, but Schlick does not reject those because they deserve to be verified conclusively. On the contrary, due to some technical disadvantages those remains to be unverified but at the end it is capable of doing the same things.

Some thinkers, Schlick says, believe that metaphysics is the exact field of solving those problems. It needs 'reason' not experience to solve those. He says, it is the rationalists who do not rely on experience. And, according to him, metaphysicians are usually rationalists. Very roughly, with some exception, this can be said that rationalist = metaphysician, empiricist = non-metaphysician though historically it is not quite correct.

4.3 EXPERIENCE, COGNITION AND METAPHYSICS

Schlick strongly hold that, 'knowledge is the communicable; all knowledge is communicable and everything communicable is knowledge.'[238] It is an urgent question in philosophical discussion that what do we understand by knowledge? And, how can we distinguish between 'knowing' and 'knowledge' of particular sort of thing? Before turning to those questions, let us peep at the core of some basic ideas for which Schlick is concerned with. He is, at the last point, concerned about indubitable truth like the

[237] *ibid.,* p.231.
[238] *ibid.,* p. 99.

knowledge of science. So, he is out to make sense of those concepts for a better understanding or good communication.

Now, how can we communicate with others? How can we transfer our experience to others for an especial sort of things? The experience of red, for example, is rather difficult to make understand someone who is unfortunately blind from birth. Or, likewise, it is also difficult to say someone what do I mean about the experience of red. Is it the same experience he holds what I exactly mean to have it? If we are in pain in muscle, how can we explain the experience of pain to the doctor about this particular discomfort that I do have now? How the doctor, alternatively, can understand what I mean by pain? Or, how can he understand the feeling of pain if he does not have the experience ever of this particular feeling? Similarly, how can we make a bridge of two experiences for two different cases? Lastly, how can we learn language from our childhood?

Along with some subsidiary functions, the aim of language is to communicate with others. We teach our children and make them acquaintance with this world by giving so many examples around us. The process of learning language begins then, when we exactly proceed to rummage through each object. This happens for all cases like table, pen, computer, bird, flower etc. What happens when I say, 'moon', for instance, to teach the learners; she/he may ask, what is meant by moon? I further explain, it is the only satellite of the earth that rotates it within its axis. If she is not satisfied enough with the answer, she might further ask, which is the thing that is called moon? We, then, show the moon pointing our finger at this simmering nugget in a moonlit night and say, oh, behold, that is moon. This is the way we follow the method to teach someone or to make them acquaintance with the objects.

Again, the problem of communication persists when we want to ascribe the meaning of our experienced subject to the case of others. I am not sure enough what I mean by red has the same meaning to that of others. It is really difficult to compare the two reds and its specifiable meaning because two different individuals have got qualitatively unlike experiences. Even then, we communicate with others by adapting some basic principles over an issue. Therefore, Schlick says,

> 'All knowledge is thus by nature a knowledge of forms and relations, and nothing else. It is only formal relations in the sense defined that are accessible to knowledge or to judgment in the purely logical sense of the word. Through the

> fact, however, that everything belonging to content, and pertaining to the subject, is no longer present in them, knowledge and judgment have forthwith obtained the singular advantage, that now their validity, too, is no longer confined to the subjective.'[239]

4.4 EMPIRICAL REALISM

Logical empiricism or consistent empiricism [240]and realism stand, seemingly, as opposed to each other. Realism advocates the independence of objects apart from mind but empiricism hold the opposite view where it is held that no objects can exists outside of human experience. But Schlick stands between these two diametrically opposed concepts and says, 'consistent empiricism, therefore, does not deny, either, the existence of an external world; it merely points out the empirical meaning of the existence-claim.'[241].He further says, 'logical positivism and realism are therefore not opposed; anyone who acknowledges our principle must actually be an empirical realist.'[242] He categorically denies any conflict between positivism and realism and finally holds that 'there is opposition only between consistent empiricism and the metaphysician, and it is directed as much against the realist as the idealist.' [243]

I think Schlick's position stands in contrast with his 'general theory of relativity and Newton's physics and special relativity[244]. In the most important chapter, The General Postulate of Relativity and the Measure-Determination of the Space-Time Continuum in *Space Time in contemporary Physics* he writes about the measure determination. He holds,

> Yet it still preserves a certain objectivity, so long as we tacitly imagine it to be provided with absolutely definite metrical properties. In the older physics every process of measurement was unhesitatingly founded on the notion of a rigid rod, which preserved the same length at all times, no matter what is its position

[239]*ibid.,* p.103.
[240]Schlick prefers to call it logical empiricism. His own words,' 'logical' or 'logical positivism' is often used; otherwise the expression 'consistent empiricism' has seemed to me appropriate.*Philosophical Papers* Vol. II p.283.
[241]*ibid.,* p.283.
[242]*ibid*., p.283.
[243]*ibid.,* p.283.
[244] Michael Friedman, p.39.

> surroundings might be; and proceeding from this all measurements were determined according to the rules of Euclidian geometry. This process was not changed in any way in the new physics which is based on the special theory of relativity, provided that the condition was fulfilled that measurements were all carried out within the same co-ordinate system, by means of a rod respectively at rest with regard to system in question. In this way space was still endowed with independent property, as it were, of being 'Euclidian' in 'structure', since the result of these measurement-determinations were regarded as being entirely independent of the physical conditions prevailing in space, e.g. of the distribution of bodies and their gravitational fields.'[245]

On the other hand Einstein's new theory (general theory of relativity) says differently:

> If we want, therefore, to maintain the general postulate of relativity in physics, we must refrain from describing measurements and situational relations in the physical world with the help of Euclidian methods. However, it is not that, in the place of Euclidian geometry, a determinate other geometry—e.g., Lobachevskian or Riemannian—would now have to be used for the whole of space, so that our space would be treated as pseudo spherical or spherical, as mathematician and philosophers are accustomed to imagine this. Rather, the most various kinds of metrical determination are to be employed, in general, as different ones at each position, what they are now depend on the gravitational fields at each place.'[246]

Friedman, lastly, and possibly more accurately explains Schlick's position thereby:

> 'Space-time in general relativity has no background geometry at all—neither Euclidian –that would be determined independently of the distribution therein; and according to the general postulate of relativity(the principle of general covariance), that only background that remains is the topological or manifold structure of number quadruples, that is, the space-time coincidences, so that: "the whole of physics can be conceived as a totality of laws in accordance with which the occurrence of these space-time coincidences takes place.[247]

[245] Moritz Schlick, pp. 46-47.
[246] Michael Friedman, p.39.
[247] ibid,p.39.

4.5 RUDOLF CARNAP (1891-1970)

In my view, Carnap is the best analytical philosopher[248] of contemporary period and one of the important philosophers of 20th century who has influenced the whole movement of logical empiricism incredibly. Among many others contribution in modern logic and philosophy of science he has left some invaluable theories like the theory of logic and probability, theory of inductive logic, modal logic[249], construction theory[250]etc. Before joining Vienna Circle he developed a physical theory of space and time. He writes a dissertation and submitted to Max Wein; a noted physicist of 20th century. He extensively read Kant's *Critique of Pure Reason.* Therefore, his entire outlook is much more critical than his contemporaries.

His first book *Der LogischeAufbau der Welt*is writtenin 1922-1925 and published in 1928 as *Aufbau. The logical Structure of the World* is renamed in 1967(English translation) which appears as one of the important classic of the recent positivistic development. For many causes *Afubau* is discussed among the philosophers. It is a large book with various topics, so the critics and interpreters take different sides of the book to frame up its significance or notoriety. It might be happened that, for many technical reasons first-time readers may be daunted due to its non-lucidity. Cristopher Pincock examines in his research work (Carnap's Logical Structure of the World[251])to show why 'so many philosophers have spent so much time trying to understand it'.[252]

At the outset, Carnap started speaking about a novel theory which he refers as Construction theory. It is stated as an epistemic-logical system of objects or concepts.'[253]The theory runs as follows: 'a constructional system undertakes more than the division of concepts into various kinds and the investigation of the differences and

[248]He was born in Ronsdorf, Germany and studied philosophy, physics, and mathematics at the university of Jena and Freiburg between 1910 and 1914. After First World War he moved to Berlin and studied theory of relativity. Albert Einstein was a professor at Berlin University over the time.
[249] Modal logic is basically a study of reasoning which involves the use of expressions 'necessarily' and 'possibly'; for the case of necessary it uses the symbol □ and for the case of possibility it uses ◊.
[250] It is a theory which deduces all concepts from fundamental concepts that it differs from most other ontologies. Carnap introduces this theory in his *Aufbau* in order to reduce the basic ideas for knowledgeable. Carnap writes here: this is introduced to apply the theory of relations to the task of analyzing reality. [*Aufbau*, p.7.]
[251] *ibid*
[252]Cristopher Pincock, Review of *The Logical Structure of The World*
[253]Rudlof Carnap ,*The Logical Structure of the World*, Routledge and kegan Paul, London, 1967, p.5.

mutual relations between these kinds. In addition, it attempts step-by-step derivation or "construction" of all concepts from certain fundamental concepts, so that a genealogy of concepts results in which each one has its definite place. It is the main thesis of construction theory that all concepts can in this way be derived from a few fundamental concepts, and it is in this respect that it differs from more other ontologies.[254] I think this is one kind of 'transformation' of sentence having exact meaning from one step to another (step-by step or chains of definition) by logical deduction. 'A' is a sentence, for example, from which another sentence 'B' can be deduced and then 'C'. This deductibility is transitive. This might be as follows: A — B — C. Carnap believes that through the successive reducibility or by the process of concatenation C can be deduced from A which, for Carnap, is *basic objects.* He believes, 'Only if we succeed in producing such a unified system of all concepts will it be possible to overcome the separation of unified science into unrelated special sciences.[255]By introducing this theory he wants to avoid unnecessary hassle of 'subjective origin of all knowledge'. It is intended to construct an objective knowledge from human private experience that may be taken as identical for all observers.

It is very clear that Carnap makes a foundation of empirical knowledge by proposing the doctrine of verificationism. The basic point of this doctrine is to justify the cognitive meaning of all scientific propositions by actual or possible sense experience. By the term actual he refers something which is directly verifiable and possible refers to principle. Some propositions which are not subject to verify directly because of some technical difficulties or other reason must not be eliminated from the network. But, metaphysics is quietly devoid of either of the quality. So, it happens to be nonsensical. It is clear that Carnap, with this theory, approaches for phenomenalistic reduction which is also called radical reductionism.

But, unfortunately Carnap has turned down his theory by himself in the face of rigorous protest from the critics. He writes, 'I have changed my position since I wrote the *Aufbau*'[256]Why does he change the process of transformation from one step to another? He confesses candidly, 'one of the most important changes is the realization that the reduction of higher level concepts to lower level one cannot always take the form of explicit definitions; generally more liberal forms of concept introduction must be

[254]*ibid*, p.5
[255]*ibid*, p.7
[256] Preface *Aufbau* p.viii.

used'.[257]In addition, he says that, 'The positivist thesis of reducibility of thing concepts to auto psychological remains valid, but the assertion that the former can be defined in terms of the later must now be given up and hence also the assertion all statements about things can be translated into statements about sense data.'[258]This was actually in a liberal format so that, for the later case, he wishes to introduce "theoretical concepts". Carnap's new version of reducibility comprises logical and methodological character of statements along with theoretical postulates and correspondence rules. He hopes that this correspondence rules may be connected with observational terms and thenceforth theoretical terms will be interpreted. He clearly opines that theoretical physics along with her advanced branches can best be envisaged by this theory.

Now, I will discuss about some objections brought against Carnap by Friedman in the *Reconsidering Logical Positivism* where he believes that Carnap's position, at least some features, here does not cohere at all with the picture.

a) Friedman objects, 'much of the actual logical construction in the Aufbau takes place within the domain of private sense experience: the domain that Carnap calls the "autopsycholoical". Carnap begins with unanalyzed momentary cross section of experience –"elementary experience"—that are related to one another by a two-place relation *Rs* of "recollection of similarity". … … It is at this point, finally, that Carnap attempts to step beyond the domain of the auto psychological into the external or physical world, in essence, by projecting color sensations onto the objects in three-dimensional space to which they correspond.[259]

Friedman asks if the aim of Carnap is only to vindicate phenomenalistic reduction why he doesspend so much time on an elaborate construction that happens within the structure of private experience. Why does he not simply take concrete sensation as primitive and devote himself instead to a more detail treatment of the construction of the physical world out of such sensation? I apprehend that much of logical construction takes place within the small domain of private experience because it would have thought that subjective origin of all knowledge lies in the content of private experience and since it is impossible to correspond with the objective world by only this experience so it needs to be conceptually comprehended. His aim, I believe, is to plod march towards objective knowledge which might be identical to all observers. This very position has

[257]*ibid,* Preface,
[258]*ibid,* Preface,
[259]Michael Friedman p. 91.

already been rejected by himself, I think. Carnap, now believes that his *extensional method* is quite unsatisfactory. So he proposes a weaker version of that claims that every nonextensional statement can be translated into a logically equivalent statement of an extensional language.'[260]

b) 'Carnap's antimetaphysical attitude is not, in the end, based on empiricist doctrine at all, but rather on precisely the attempt to find a peculiarly philosophical vantage point that is neutral with respect to all traditional metaphysical disputes. That is, Carnap does not ultimately reject the metaphysical tradition on crudely verificationist grounds, but rather because he thinks he has found a replacement—a "scientific" replacement–-for metaphysics.'[261]

I am fully agreed with Friedman's view as mentioned above that Carnap wants a scientific replacement for metaphysics in his whole thesis. Carnap's contention is very clear. He explores factual content for the meaningfulness of statements in order to reject metaphysics. He strongly believes that, 'all empirical sciences (natural science, psychology, cultural sciences) acknowledge and carry out in practice the requirement that every statement must have factual content.'[262]

4.6 A J AYER (1910—1989)

Ben Rogers, biographer of Ayer, writes in his *A. J. Ayer: A Life,*

'As Ayer conceivedit; philosophy is essentially a second-order discipline. It cannot discover anything about the world; only empirical science can do that. Nor can it tell us how to live –at most it can, as Ayer did again and again, that there is no truth in morals or art, no right answer to the fundamental question of life. Instead, philosophy is the inquiry what we mean when we refer to causation, the mind infinity; into what we are asserting when we assert that a table is made up of indiscernible particles, that pain is caused by certain processes in the brain, that a nation is something above and beyond its members, that a murderer acted 'freely'. Philosophy is concerned with the analysis, paraphrase, translation or reduction of these or other perplexing statements so that we

[260]Carnap , Preface, p,ix
[261] Friedman,p.94.
[262]RudlofCarnap, *Aufbau,* p.328.

can see precisely what sorts of claim are being made – in exactly what circumstances they are true.'[263]

The above quotation makes a clear picture about the philosophical views of Ayerdepicted by his biographer Ben Rogers.Philosophical position of Ayer is very clear. But it should be noted that Ayer, with the face of serious criticism from home and abroad, changed his position slightly from his earlier stand. Accordingly, the last phase of his life is something different to that of earlier. Following his graduation he started living at Vienna in 1932-33. During this time he comes across Vienna Circle. His magnum opus *Language, Truth and Logic* (LTL) published in 1936 which is taken to be the *preamble* of the entire development. Ayer was only 26 during the time of his first work. So, many of his critics attack him as a deed of a belligerent young and that is why, it is so much acrimonious and unabashed piece of writing. Ayer himself conceded his earlier position towards metaphysics as almost futile exertion that finally fails to make any sense. In an interview with Brayan Magee he confesses candidly that the process by which he tries to uproot metaphysics was not noteworthy. And, it never fulfills the purpose of anti-metaphysicians. However, it leaves remarkable vestiges over the whole issue that culminates at a serious point. Many present day philosophies have been taken off important parts of empiricist's legacy.

4.7 Metaphysics is non-sense

Ayer argues that there are only two classes of meaningful statements—analytic and synthetic. He strongly holds that, 'if philosophy was to constitute a genuine branch of knowledge it must emancipate itself from metaphysics.'[264]Ayer was greatly influenced by Hume. In the editorial introduction to *Logical Positivism* he started writings about the influence with whom he indebted most. He cites from *Enquiry Concerning Human Understanding:* "When we run over libraries, persuaded of these principles, what havoc must we make? If we take in our hand any volume; of divinity or school metaphysics, for instance; let us ask*, Does it contain any abstract reasoning concerning quantity or number*? No. *Does it contain any experimental reasoning concerning matters of fact and existence*? No. Commit it then to the flames: for it can contain nothing but sophistry and illusion."[265]Ayer says, this is an excellent statement of the positivist's

[263] Ben Rogers*, A.J Ayer: A Life*, Grove press, New York, 1999, Preface , p.2.
[264]Ayer, *Logical Positivism,* p.10.
[265]Hume, *Enquiry Concerning Human Understanding. P.*

position.[266]What does Ayer express in the above quotation? It is very clear that Hume divided all meaningful sentences into two categories: *relation of ideas* and *matters of fact*. Mathematical reasoning and logical hypothesis are actually nothing but relation of ideas. On the other hand all sentences about physics and physical world are of course about the matter of fact. Therefore, they are meaningful. But, other than these two categories all sentences are nonsense. Ayer says, logico-mathematical sentences are tautological so they are a priori. They are beyond any question because their certainty has been proven by logical deduction. On the other hand, sentences about the physical world are empirically verifiable. He says, ' These classes were supposed to be exhaustive: so that if a sentence succeeded neither in expressing something that was formally true or false nor in expressing something that could be empirically tested, the view taken was that it did not express any proposition at all. It might have emotive meaning but it was literally nonsensical.'[267]If we talk about the transcendental entities, absolute, or destiny of man or even about the poetry we finally talk about nothing, Ayer believes. But he does not believe like Hume that metaphysical sentences need to throw into the flame. He categorically says that, 'metaphysical utterances were condemned not for being emotive, which could hardly be considered as objectionable in itself, but for pretending it to be cognitive, for masquerading as something that they were not.'[268]I will discuss here about Ayer's views about metaphysics under two distinct headways: a) metaphysics can't be a comprehensive world outlook; b) metaphysics is purely non-cognitive.

Philosophers who imagine the function of metaphysics is to build up a comprehensive and integrated world views are not doing the right job, Ayer thinks. He thinks that metaphysician claims to have a world views to grasp the entire picture of the universe. They also claim to draw the structure of reality. But, Ayer turns down their claim as saying that it is not possible for only a section of our study to draw the line of any reality. If it happens that metaphysic is trying to bundle up discursive human knowledge then it must need to depend on science which leaves its particular and special functional knowledge. So, their claim does not make any sense whatsoever. Modern science is trying to build up a Grand Unification Theory (GUT)[269]to explain the whole world

[266] Ayer, *Logical Positivism*(ed.) p.10.
[267]Ayer, ibid,p10.
[268]*ibid*, pp.10-11.
[269] GUT unification of general theory of relativity and quantum mechanics .. Ayer is not optimistic about the operation of such theory because it is not factually possible to make a reconciliation between organic and inorganic world.

correctly by the unification of different theories about the nature. That was the aim of Einstein on which Stephen Hawking is doing research presently[270] is entirely different to that of metaphysician's claim. Ayer does not concede such claims of metaphysicians to be justified. If metaphysician approaches to build up such theory like GUT it needs to exhort particular science like physics, chemistry, and mathematics. Accordingly, if scientists become successful to take hold of such theory there would have been no function of philosophers let alone metaphysicians. Metaphysician claims that it integrates all scientific data not compile the fact. It is rather important that compilation and integration are two different functions. Metaphysical theory collects information form the world and collocate that data according to their merit. In effect, metaphysics symmetrically conjoin different theories of science and possibly this is the main characteristic of metaphysics that makes difference to other parts of human thoughts. Ayer is very unhappy with those approaches of metaphysicians because he strongly maintains that it is the function of science that makes the integration. Metaphysics cannot have a distinct role like science. So, it cannot be a complementary study as science as well. In the history, it is often said that metaphysics is a competitor of science, where science deals with the appearance and the world of phenomena only, metaphysics deals with reality: the inwardness of appearance.

In *Central Question of Philosophy* Ayer has explained the so-called characteristic of reality where he maintains that the division between appearance and reality is unnecessary. In the traditional philosophy it is argued that appearance means false and spurious which deceive and mislead human cognition. Ayer argues, this misunderstanding persistently occurs because of the fact that metaphysician fails to register actual definition of reality. They actually make an unnecessary division between the same things; where there is no theoretical dissonance between these two. Suppose a stick seems to be crooked if it is dipped into the water. The crooked part of the stick is supposed to be called appearance, and the part which is out of the water is reality. Ayer says, this is nothing but a contrast between two phenomena, one is in open air and the other is in a conditioned situation. These two parts of the stick are commonly happened to be an object of human perception. What metaphysician terms it as a contrast between appearance and reality is substantially unworthy. It is of course contrast between two phenomena. When the stick is taken out of the water it founds to be straight. What does it imply? It implies that one false perception is confuted by another perception where

[270] S. Hawking writes this issue in his famous book in Brief History of Time.

there is no scope of being metaphysicians in order to seek the so-called real part of the stick. So, the whole debate between appearance and reality is unmethodical.

Second section of the discussion is much more unpleasant to the metaphysician debated by Ayer. He categorically rejects minimum possibility of transcendental knowledge claimed by traditional philosophers. They constantly persist that 'reality is spiritual', 'space and time are not ultimately real', 'everything is one' and many other sentences which do not make sense to the ordinary people. Ayer says, all the sentences or the views like those are not informative, therefore, non-cognitive. It is quietly misleading and creates serious havoc to the reader. In the history, many philosophers, Plato for example, divide the world into two kinds –perceivable world and the world of ideas or forms. Nothing is eternal or real of the perceivable world because everything is becoming according to Plato. But the world of form or ideas is real because it is eternal and unchangeable. Plato thought that essence or forms of object is eternal and it is unchangeable. There are different types of table in the world, different types of cat are found in the world but the word 'table' or 'cat' is form of objects. Even if there is no cat and table in the world the idea of cat and table will never vanish. According to Ayer, Plato has committed the mistake because he does not care that if nothing exists in the world whatever it might be there would have been no idea of anything. Here, Plato unhesitatingly emphasizes on human reason instead of sense. He attacks Descartes, Spinoza and Leibnitz in a row for the rationalism where they unduly stress on human intellect defying sense or experience. Ayer replies all of them and says it is improbable to depict a world picture with the help of reason. He comes to the conclusion that it is impossible to grasp a world views where there is a difference between the nature of the world and what it appears to be. Kant commits a serious mistake when he attempts to reconcile "a priori" and "synthetic". Ayer never professes any possibility to have knowledge through the reconciliation.

Ayer's first book *Language, Truth and Logic* (LTL) is an especial treatment of philosophical problem which is probably unprecedented because of the logical outcome of empiricist tradition of Britain. Ayer introduces this philosophical network to the English speaking world and also the Berlin group with this LTL. He confesses that he takes hold the tradition of Berkeley and Hume and immensely indebted to Russell and Wittgenstein. But, truly speaking, neither of them were logical empiricists even many of their writings stand against the philosophy of crude empiricism. Russell, as a

philosophical skeptic, is nota truly believer of empiricism where he unequivocally expresses: 'all human knowledge is uncertain.'[271]

In spite of their different positions, I think Ayer expresses his gratitude to all of them (Russell, Wittgenstein, Popper along with many other philosophers),who inspired them directly or indirectly to their entire philosophical project. Importantly, Ayer was different to Schlick in most cases because he was a complete philosopher where Schlick was basically a physicist, so all his philosophical analyses are much more critical than Schlick. Ayer thinks that philosophical development in history has been divided by two distinct methods of epistemic progress—deductive and inductive. Deductive system ultimately fails to add new knowledge because the main premise of the inference is always taken to be granted which can never be questioned. He questioned about the structure of deductive system though finally accepts its certainty. Analytical propositions are posited though Ayer stands against deductive system. Metaphysicians are basically follower of deductive system. I think that Ayer fails to make the distinction between the method of mathematics and metaphysics. In *LTL* he writes, 'The traditional disputes of philosophers are, for the most part, as unwarranted as they are unfruitful. The surest way to end them is to establish beyond question what should be the purpose and method of philosophical enquiry.'[272]By philosophical enquiry he means logical expedition by which we can rummage through philosophical discussion. He holds, if philosopher wants to end off dispute in traditional philosophy it needs to ask them: what is the valid reasoning by which the metaphysicians or traditional philosophers draw their conclusion?

It is important to note that Ayer in the first edition of this book was very uncompromising and unperturbed as an empiricist where he completely turns down all sentences which stay out of the empirical network.

[271]Russell, *Human Knowledge*, p.527.
[272]Ayer, *LTL*, p.

5.

CRITERION OF MEANING

This question now turns out to be exceedingly important from our part: what is the criterion by which we can justify a sentence or statement to be meaningful? Obviously, I think, this question is much more important than that, what do we understand by the term "meaningful" or "meaningless" itself? If someone visits at an art gallery and finds a good number of drawing boards having only scribbled inside it; the question plainly comes round in the mind: what actually the gibberish stands for which I can't make it out? In the visiting note, connoisseurs write huge number of eulogies. It follows that, what I find as scribbled and cannot understand thereupon must have a deeper meaning in one sense or either.

What is meant by the term meaningful or meaningless? No straight-cut answer could satisfy our purpose, since philosophers in history intensely debated over this issue. One of the very popular ideas about meaningfulness is understandability. Ordinary people may reply, 'I understand its meaning so it is meaningful' or 'it is meaningless because I do not understand anything from the sentence.' However, I think, in effect, it does not carry any deeper meaning for this purpose. In many cases, in our ordinary life, the term meaningfulness is taken to be synonymous with understandability. Accordingly, philosophers are not convinced with this plain atmosphere in all cases, so they want to formulate a criterion of meaningfulness which has occupied major sections in analytic or linguistic philosophy.

In this section, I will explore the basic tenet of the logical empiricists, i.e., how did they attempt to disown metaphysical sentences from philosophical realm. I argue that in spite of some amendment of the criterion it fails finally to come across setbacks. Suppose, I am not able to understand the meaning of the theory of relativity, do not understand Heisenberg's Principle of Uncertainty or even Kant's ideas about space and time etc. What does then follow? Will those theories or ideas be discarded as meaningless thereafter? No. This cannot be rejected because it usually happens that there are so many things in the world which I do not understand. All those things are not meaningless despite the fact that major sections of those ideas are indescribably abstruse. Therefore, the ideas of replacement of understandability in the place of

meaningfulness do not fit with fact. I cannot understand its meaning but you can; you cannot understand but I can; what we cannot understand people can understand. For as much, this is understandable at least to some people who are highly specialized in those areas, so this can never be branded as meaningless.

Sometimes, meaning is only taken as a translation from one term to another easier term. Dictionary is used for meaning translation; sometimes from one language to another or one word to another within the same language. Here, an important issue is noted that there must be an inter-language stipulation in order to specify the same object by the different words in different languages. Suppose, what is water? One may say that 'water is a compound which is a combination of Hydrogen and Oxygen where two atoms of hydrogen combines with one atom of Oxygen (H_2O)'. Again, someone even hold that 'water is a colorless, transparent and odorless liquid which is usually found in sea, river, lake, rain, or beneath the ground surface'. So, there can be different definitions of water which is finally taken to be the meaning of the exact term. But, for the present purpose we will explore somewhat different issues for which the philosophers of 20thcentury were curiously engaged upon themselves. We will justify here, in what sense a word or a statement can be ascertained to be meaningful. Let's follow some ideas in this connection to understand the exact meaning of the term.

It is not sure, what does metaphysician actually mean by this term "meaningfulness" since the time of Plato, even though most philosophers in history are gifted metaphysicians. By this term, what I think metaphysicians strongly go for such realization which is extremely inward and perhaps untranslatable to someone who don't have such feelings or state of realization. Lord Goutom says his disciple that, *Nirvana* is such kind of realization that nobody could be able to understand if he does not have such state of mind. It is extremely personal and may be one of the most obscure human feelings that can never be justified by our commonsense belief. Thus, in a word it is characterized as mystic. Generally speaking, idealists are metaphysicians with very rare differences. In the oriental metaphysics, *Upanishad* particularly, expresses such spiritualism that is not very easily construed by the preachers.[273] Logical empiricists debated much about those experiences which are usually happened to be transcendental

[273]Upanishad :the oldest scripture of India and perhaps one of an oldest scripture in the world says, *isavasyamidamsarvath/ yatkincajagatyamjagat/ tenatyaktenabhunjitha/ ma grdhahkasyasviddhanam* [Everything animate or inanimate that is within the universe is controlled and owned by the Lord. One should therefore, which are set aside as his quota, and one must not accept other things, knowing well to Whom they belong.]

and proposed a criterion by which one can justify its status: whether any statement is meaningful or not. Carnap very strongly retorted as: 'Perhaps we may assume that metaphysics originated from *mythology*. The child is angry at the "wicked table" which hurt him. Primitive man endeavors to conciliate the threading demon of earthquakes, or he worships the deity of the fertile rains in gratitude. Here we confront personifications of natural phenomena, which are the quasi-poetic expression of man's emotional relationship to his environment.'[274]Now, let's turn to the view by which the empiricist attempts to make the distinction between metaphysics and philosophy.

5.1 Verificationism

The principle of verification or verifiability principle is a criterion of meaning proposed by the logical empiricists which is applied solely to non-analytic, non-contradictory statements. If any statement P is taken to be meaningful, for example, it needs to justify the relation with the statement Q whose truth or falsity can be determined by simple observation directly or indirectly. Accordingly, it becomes a very difficult task for the positivists to establish the relation with Q because of numerous functions of language as well as its correspondence with reality. Positivists, at the initial phase, could not apprehend the result of this formidable proposal. The fact is that, it had to face tremendous challenges from almost all philosophical vantage points. The aim of this proposal was very simple. It is only proposed for a demarcation between science and non-science. Very precisely, it attempts to reject metaphysics from philosophical discipline. In the history of philosophy, for logical empiricists, most of the philosophical pursuits were unfruitful because of the nature of discussions. Scott Soames writes, 'As they saw it, the cause of past philosophical confusion and the reason for the lack of more significant progress in the discipline was that philosophers hadn't realized that all meaningful statements have to be either analytic, contradictory, or empirically verifiable.'[275]Schlick unhesitatingly announces that 'the meaning of a proposition is a method of its verification.'[276] In fact, it is not clear how the meaning of a proposition may thus be equivalent to its method. Actually, the intention is very clear. Schlick wants a method which needs to be followed in order to find out the meaning of assertions. And, he finds the methods in the process of verifications. He thinks that it is the method

[274]Rudlof Carnap, The Elimination of Metaphysics Through Logical Analysis, in Logical Positivism, edited by A. J. Ayer, 1959, p. 78.
[275]Scott Soames, *Philosophical Analysis in the Twentieth Century,* Princeton University Press, Princeton, Oxford, 2003, p.272.
[276]Schlick, *Philosophical Papers*, p. 460.

in which an assertion can be justified as like as its meaning. For example, a scientific theorem is constructed by some facts which are testable of observation. Obviously, it follows that the theory is constructed by some theoretical statements and in addition to that it needs some observational statements. Why do we need observational statements? Here, Schlick proposes that in order to understand the theoretical meaning we need to justify observational statements. And, this is the same method by which the truth of a theoretical statement is ascertained as well as its meaning. By this way, the relation between verification and determination of meaning is established according to Schlick. In "Meaning and Verification" he writes in a reply to Professor C. I. Lewis[277] '… no sentence has meaning unless we are able to indicate a way of testing its truth or falsity is not very useful if we do not explain very carefully the signification of the phrases 'method of testing' and 'verifiability'[278]

It is carefully noticed that Schlick has stressed the need to assert the meaning of sentence rather than only its verification. He is much interested about the actual meaning of sentence. According to him, if we do not understand the meaning of sentence, how can we approach to verify it? Another important characteristic of Schlick's process is 'verifiability' not 'verified' actually. His proposal of verifiability is very similar to the idea of Ayer's verifiability in principle. This issue is left for a while. Now, we will turn to Ayer who is virtually responsible for rising and falling of this much-discussed criterion—the principle of verifiability.

5.2 Ayer on verifiability

Ayer was not interested practically about the meaning of sentence. Rather, he has employed himself for the most part of his life to formulate a principle and to rationalize those claims one after another. Although Ayer borrowed the ideas of meaningful sentences from Hume[279],he differs from Hume on good number of points. Hume also proposes to burn all non-factual gibberish (metaphysics) but this was not quite right to imagine that Hume's writings were full of experimental content. Most part of Hume's

[277]C. I. Lewis, "Experience and Meaning," *Review,* March, 1934. Schlick writes, Lewis criticized the basis as adequate on the ground that its acceptance would impose certain limitations upon 'significant philosophic discussion' which, at same points, would make such discussion altogether impossible and, at other points, restrict it to an intolerable extent. Detail, Schlick, *Philosophical Papers*, p. 459.

[278]Schlick, *Philosophical Papers*, p. 460.

[279]Ayer's main contention concerning meaningful sentences was borrowed from Hume. Hume in his *Concerning Human Understanding* make the difference between two kinds of sentence – "relation of ideas", and "matters of fact". Other than these two categories Hume denies to have any meaning. Ayer has picked up the idea and writes in favor of the contention.

essays lack experimental generalizations, Ayer believes. However, it is also correct in an important sense that Ayer finds the anti-metaphysical germ in Hume's writings. And, in great part, Logical empiricists were seriously indebted to Hume for many inspirations. In *Language, Truth and Logic* Ayer tries his best to formulate this proposal and to recapture the claim in order to destroy metaphysics. Schlick argues that if we want to explore the meaning of a sentence it creates some unavoidable circumstances. What is that? These proposals were different from some points though the aims of those philosophers are same. Suppose, I want to justify a scientific theory according to the principle of Ayer what then follows? I will be satisfied only accepting it as meaningful, if the principle of Ayer is applied on theory and finds that it is alright because it does not collide with the principle. But, follower of Schlick will never be satisfied until the meaning of the theory is unearthed. According to Ayer, this proposed principle is not an easy as it is thought to be. A scientific theory needs to be authenticated on various points amid different situations. It is sure that, a scientific theory may lose its scientific meaning with the advent of new reasoning. So, we cannot take the risk of that situations and it is rather troublesome. So, we should only be pacified with the reality that it is at least meaningful; meaningful in a sense that it just follows our principle.

In *Language, Truth and Logic* Ayer offers some proposals[280] of meaningfulness. We will justify this attempt from different points of view and some inevitable consequences on the way to its various phases.

- Proposal: 1

A statement P is meaningful if only it is known to be verified *practically*; or, if P entails some statements on Q is an inevitable continuity.

- Proposal: 2

If P is impossible to be verified practically it needs to be ascertained that at least it is verifiable *in principle* or, if P entails some statements Q is an inevitable continuity.

- Proposal:3

A statement P is said to be verifiable, if and only if its truth or falsity could be conclusively established in observation.

- Proposal:4

[280] All the proposals are summed up from *Language, Truth and Logic in* order to discuss pros and cons about various kinds of possibilities. To formulate these questions all proposals are categorized step by step. For details see LTL, p.

If a statement P is not possible to be verified strongly it needs to be ascertained that at least it is weakly verifiable i.e., if it is possible for experience to render it possible.

- Proposal:5

A statement is directly verifiable only when it is an observation statement and in conjunction with one or more observation statement it entails at least one observation statement that is not deducible from these premises alone.

- Proposal: 6

A statement is indirectly verifiable when in conjunction with other premises it entails at least one directly verifiable statement which isn't deducible from the premise alone and these other statements do not include statements that aren't either analytic or directly verifiable or capable of being verified. We will now follow step by step about those proposals with cross arguments.

Proposal 1 and 2 are very plainly formulated by Ayer. The result of this proposal is obviously intertwined with psychological construction. For example, 'X is cold', 'Ice is white' or 'the present prime minister of Britain is male' are the sentences which are somewhat dependable on direct experiences or proper references. Questions against this proposal become very unpleasant and trouble making that could not be addressed easily. Whenever something is related to human senses it obviously follows some complications. "Arthropods" is a group of animal which are characterized as "segmented bodies", "jointed legs" etc. Now, it is said, "this thing is a Crab which is a member of arthropod". Carnap specifies that the meaning of a sentence can be fixed up by reduction to other words one by one. Finally, he says that 'By means of these stipulations about deducibility (in other words: about the truth-condition, about the method of verification, about the meaning) of the elementary sentence about "arthopode" the meaning of "arthopode" is fixed. In this way every word of the language is reduced to other words and finally to the words which occur in the so-called "observation sentence" or "protocol sentence".[281]But, the problem with observational sentence is well known to the critics. Quine,[282] particularly, objected seriously about the verification of single sentence particularly when disregards the auxiliary circumstances..

[281] Rudolf Carnap ,"The Elimination of Metaphysics Through Logical Analysis of language", in LP. p.63.

[282]Quine does not believe that a single sentence can be verified individually. He proposes a holistic approach to make it possible. In his essay "Two Dogmas of Empiricism" Quine has announced that

Ayer makes the difference between *practical verifiability* and *verifiability in principle* which is virtually an extended form of the principle. Ayer did not have to face serious objection about the issue of practical verifiability; but there remains a good number of objections about the verifiability in principle; however, he manages those. For example, a statement like 'there is a mountain on the further side of the moon' is not insignificant despite the fact that no observatory tactic is possible presently to detect its veracity. Will it thus be inconceivable and flaws as a statement? No. This statement, Ayer believes, is not like 'the Absolute enters into, but is itself incapable of 'evolution and progress'[283].

Further, Ayer approaches for another distinction between 'strong' and 'weak' (proposal 3 and 4) sense of the term 'verifiable'.[284] This most important point which is adopted by the positivists is the subject of conclusive verifiability. Many propositions like 'all cooper conducts electricity', 'all men are mortal', do pose the character that their truth cannot be ascertained by finite number of observations. But the question remains unscathed, 'And then, if we adopt conclusive verifiability as our criterion of significance, we are logically obliged to treat these general propositions of law in the same fashion as we treat the statements of the metaphysicians.[285]

Here, the basic problem for universal statement becomes the most notorious discomfiture for inductive method builder. Ayer has conceded this discomfiting sore and tries to address the problem as such: 'For a piece of gold it is a material thing; and to test the validity of propositions referring to material things we must ascertain the truth or falsehood of propositions referring to sense-data.'[286] He concludes here by proposing and advocating in favor of sense-data, 'A proposition referring to a material thing may entail propositions referring to sense-data but cannot itself be entailed by any finite number of them.[287] Therefore, Ayer reaches at the last point of a proposition whose truth or falsehood may be determined by directly confronting given facts. This is proposed as basic proposition. Scott has proved that universal generalizations along with the negation of existential generalizations are neither conclusively verifiable nor conclusively falsifiable.[288]Again, Ayer sees another change in verification principle. He

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individual sentence is often misunderstood when it is taken to justify its veracity. Therefore, he rejects positivistic contention.

[283]*LTL,* p.17.

[284]*LTL*, p.18.

[285]*LTL,* p.18.

[286] Ayer, "Verification and Experience", in *LP,* p.229.

[287]ibid, p.229.

[288] I will place the whole issue here as exactly Scott's arguments against conclusively verifiable or conclusively falsifiable. **Conclusive verifiability:**

introduces observational statement instead of experimental proposition. What is then observation statement? In fact, it includes an actual or possible observation. Therefore, Ayer reaches at a new phase of the amended version. Now, he holds that, 'if some observation-statement can be deduced from it in conjunction with certain other premises, without being deducible from those other premises alone.'[289]

But, this new version is not satisfactory to Ayer. He thinks that it is too liberal. If the present version is accepted then many meaningless sentences may turn to be meaningful. For example, if a given statement is P, and the observation-statement is Q, the argument may be as follow:

P

If P then Q

∴Q

[Here, any observation-statement like Q may turn to be meaningful.]

See, 'the Absolute is lazy' and 'if the Absolute is lazy, this is white' jointly entail the observation-statement 'this is white', and since 'this is white' does not follow from either of these premises, taken by itself, both of them satisfy my criterion of meaning.'[290] But the problem is very deep. Here, it is taken that "the Absolute' is a metaphysical term but the sentence 'Absolute is lazy' is not metaphysical at any rate. In fact, if we concede the new version of the principle then many genuine metaphysical

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i) All moving bodies not acted upon by external forces continue in a state of uniform motion in a straight line.
ii) All solid bodies expand when heated.
iii) All swans are white.

These examples are of the form (iv).

iv) ∀x (Ax →Bx) All A's are B's. Although these sentences are clearly meaningful, the statements they express are not logically entailed by any finite, consistent set of observation statements, or indeed, by any consistent set of statements An, Bn, …, no matter what may be size. Since sentences of the form (iv) are logically equivalent to those of the form (v), the same is true of negations of existential generalizations.

v) ~∃x(Ax& ~Bx) It is not the case that there is something which is A but not B.

Conclusive falsifiability

The negation of an example of the form (iv) has the form (vi).

vi) ~∀x (Ax→ Bx) Not all A's are B's.

vii) ∃x (Ax & ~Bx) At least one A is not B.

If A and B represent observable characteristics, then (vi) and (vii) are logically entailed by the set of observations sentences (viii).

Viii) An, ~Bn. Thus the corresponding universal generalizations of the form (iv), and negations (of the form (v)) of existential generalizations, are conclusively falsifiable.

Scott, *The Empiricist Criterion of Meaning*, pp.278-279.

[289]LTL, p.179.
[290]LTL, p.179.

sentences like 'Absolute is completely kind being' can unfortunately be incorporated into meaningful section of ideas.

5.3 Why and How Ayer changes positions?

Ayer, at the outset, proposes many alternatives in which one of them is such: a sentence is factually significant if and only if it is known to the verifier that in what condition the proposition which it express can be accepted or rejected. But, it seems to be defective to Ayer. It was taken as granted during the time of this proposal that man always thinks logically. Sometimes, man fails to detect the actual reason of events. Suppose, a man longs for rain and if the belief comes true he may concludes that God exists. But, if the previous proposal would accept any how, it would have been innocent to assume a sentence like God exists. Ayer's first proposal does not announce *perfect* observation which can guarantee a sentence for its factual significance. The fact is so risky that if the proposal would accept without criticism, many genuinely non-factual sentences would have been intruded. Ayer was careful about the proposed observational sentence and he likes to call it experimental sentence, particularly, a sentence like "the flower is odorless". It becomes important to note that Ayer stress the need to be careful about genuinely factual propositions.

Now, we want to justify a sentence like, "all yellow flower is odorless" whether it is factually sound or not. As an auxiliary sentence (2nd premise of the argument) it is taken "this flower is yellow". According to the argument,

All yellow flowers are odorless (major premise)
This flower is yellow (minor premise)
∴This flower is odorless (experimental proposition)

It willbe noticed that the experimental proposition must not be deduced from the minor premise alone. So, two major characteristics of the argumentsare followed thereby: i) it needs an additional proposition, ii) the experimental proposition is deduced from both the premises. Ayer thus concludes that 'all yellow flower is odorless' is genuinely factual. So, this proposition is verifiable and meaningful thereafter.

Following the publication of LTL Ayer faces some serious objections especially from I. Berlin. In his essay "Verifiability in Principle"[291] Berlin shows that the criterion proposed by Ayer is too liberal. He argues that any sentence regardless its status may turns to be meaningful according to the principle. Let's see the consequence. Take, a sentence "God is unkind to the disbelievers" to verify its factuality. Berlin argues that in spite of serious reluctance about this sentence Ayer could not prevent it from being meaningful if he follows the version. Let us, take a sentence like, "if God is unkind to the disbelievers then the leaf of tree is green" as an auxiliary sentence. It follows the consequence:

God is unkind to the disbelievers [major premise]
if God is unkind to the disbelievers then the leaf of tree is green[minor premise]
∴ the leaf of the tree is green. [Experimental proposition]

Here, two important prescriptions have been followed from this principle. One is deduced with the help of other proposition, an experimental proposition deduced from the major premise; another, this experimental proposition is not deduced from the auxiliary premise alone. So, Ayer now should not be unconvinced to accept the proposition like "God is unkind to the disbelievers" as factual and of course meaningful according to his own structure.

Ayer has conceded all the objections because those were very convincing. So, he plans to modify its previous version and proceeds on to its direct and indirect verifiability.

5.4 Direct and Indirect principle
(Last amended version)

Facing challenges to the new formulations, Ayer takes the last phase of his proposed principle as follows[292]:

a) A statement is **directly verifiable** if it is either itself an observation-statement or is such that in conjunction with one or more observation-statements it entails at least one observation-statement which is not deducible from these other premises alone.

[291]

[292] *LTL*, p.181.

b) A statement is **indirectly verifiable** if it satisfies the following conditions: firstly, that in conjunction with certain other premises it entails one or more directly verifiable statements which are not deducible from these other premises alone; and secondly, that these other premises do not include any statement that is not either analytic, or directly verifiable, or capable of being independently established or indirectly verifiable.

Ayer was careful about Berlin's objections. So, to escape the trouble of some kinds he sees carefully about the nature of "other proposition" and argues that it must be observational-statement. Remember, in the old version the auxiliary-statement was not an observational statement. Moreover, "if God is unkind to the disbelievers then the leaf of tree is green" was not an observational statement at all. No doubt that any sentence which is rather conditional (If, then) cannot be an observational-statement.

In the indirect form, as proposed above, the auxiliary statement must either be an analytic, or directly verifiable, or indirectly verifiable. Berlin's objections thus be met in this way. Ayer reminds that "if God is unkind to the disbelievers then the leaf of tree is green" is a sentence which actually is devoid of those characters. So, "God is unkind to the disbelievers" can never be a factually grounded sentence. Ayer thinks that it was just areply to the critics. But, another huge blow was waiting for him when the second version is published in 1946.

5.5 Alonzo Church on Verifiability

In the Journal of Symbolic Logic[293] Church shows that even after some modifications in the second edition the principle of verifiability cannot be discharged from major lapses. Church takes three distinct observational-statements viz. O_1, O_2, O_3. These observational statements are such that no statement can be entailed from another. In addition, he uses a general sentence S. The content of the sentence can be everything—real, unreal or whatever may be. He shows that if we take a sentence like $-O_1O_2 \vee O_3-S$ as an auxiliary of S, it logically follows'O_2'as an observational sentence. Here, 'O_2' cannot be entailed from the sentence ($-O_1O_2 \vee O_3-S$) alone. What does it indicate? It indicates that from any sentence like 'S' with help of a premise like($-O_1O_2 \vee O_3-S$) an

[293]Alanzo Church, Review of A.J Ayer's *Language, Truth and Logic*, second edition, Vol.14, No.1 (march,1949) pp.52-53. §Church argues,' For let O_1, O_2, O_3 be there "observational-statement" (or experimental proposition) such that no one of the three taken alone entails any of the others. Then using these we may show of any statement S whatever that either it or its negation is verifiable. Then (under Ayer's definition) $-O_1O_2 \vee O_3-S$ is directly verifiable, because with O_1 it entails O_3. Moreover, S and $-O_1O_2 \vee O_3 -S$ alone entails O_2, in which case S and O_3 together entail O_2. So, that –S is directly verifiable.'

observational-statement 'O_2' is deduced. This O_2' may be a directly verifiable sentence. It follows the amended version of the principle. So, according to the version 'S'is indirectly verifiable but the problem is: S is taken as any statement. If this is true, then it can be plainly assumed that according to the corrected version of the principle any statement like S can be proved itself to be meaningful. It obviously entails that Ayer's project could not save the principle ultimately from serious lapses.

Church's arguments are as such:

1. $(-O_1O_2)$ v $(O_3$-S)
2. S $\nearrow\therefore O_2$
3. $[-O_1O_2$ v $O_3]$. $[O_1O_2$ v S] …… 1, Dist.
4. $[O_1O_2$ v S] .$[-O_1O_2$ v $O_3]$ ……2, Com.
5. O_1O_2 v S …….. 4, Simp.
6. –S v (- $O_1.O_2$) ……5 Com.
7. S $\supset$(- $O_1.O_2$) …….6, Impl.
8. - $O_1.O_2$ ……2, 7, M. P
9. O_2. - O_1 .....8, Com.
10. O_2 ...9,,Simp.

Here is an important question about the status of 'O_1O_2v O_3-S' statement. Church was fully conscious about it. He thinks that, this statement is directly verifiable since, it does not contradict with the two rules of logic. Firstly, if it includes O_1 along with the above premise it entails the observational statement 'O_3'. Secondly, O_3 can never been tailed alone from O_1. Ayer actually means these two conditions to be directly verifiable.

If we want to validate the first claim of Church we need to go further for another logical deduction. This might be as follows:

1. $(-O_1O_2)$ v $(O_3$-S)
2. $O_1 \nearrow\therefore O_3$
3. [$(-O_1.O_2)$ v $O_3)]$. $[(-O_1.O_2)$ v -S)] ….. 1, Dist.
4. $(-O_1.O_2)$ v O_3 .....3, Simpl.
5. O_3 v $(-O_1.O_2)$ .....4, Com.
6. $(O_3$ v $-O_1)$.$(O_3$ v $O_2)$ ..... 5, Dist.
7. O_3 v $-O_1$ ..... 6, Simpl.

8. $-O_1 \vee O_3$ .....7, Com.
9. $O_1 \supset O_3$ ..... 8, Impl
10. O_3 .....2. 9 M.P

Church's claim is finally accepted by Ayer. He declares it in *The Central Question of Philosophy*. We will now turn our attention to some different points at the same time. The question is very logical from this point of view that, why does Ayer approaches to the additional premises to justify the observational-statements? It seems to be clear that no observational statement stands alone for its verification in order to make sense. For example, if we want to verify a statement like 'there is a chair at the head of the table' we need to be careful about many conditions at the same time. In principle, we need to agree that 'while we are observing our eyes are open', 'we are observing in a deep dark', 'there has been no obstacle between eyes and table' etc. Moreover, we need to follow many other conditions successively may come one after another. So, factually it is not an easy way to justify the claim as proposed by the new version.

Here, we will see more expansion of our present discussion. What is the basic point of judgment or *verification condition*, for logical empiricists, which can testify the fecundity of statements? This formulation is very simple—that should be either analytic or synthetic—and no other judgments regarding this issue can be brought under this stipulation. Logical empiricists borrowed this idea—analytic and synthetic—from Hume which virtually stands against Kantian theory of analytic-synthetic divisions[294]. A statement is regarded to be analytic if this is necessary and happens to be contradictory when it is denied. Analytic statements are *a priori* in nature and eventually logico-mathematical statements are classified as *a priori*. And all statements of natural science, history, sociology, are taken to be synthetic. Synthetic statements are contingent and *aposteriori* in character. Ayer makes it clear that if we want to test the genuineness of statements it must follow the following stipulation: 'we say that a sentence is factually significant to any given person, if and only if, he knows how to verify the proposition which it purports to express – that is, if he knows how

[294] Analytic-synthetic judgment have been brought under consideration by Kant in different ways, especially when he approaches for synthetic as a priori then the whole issues fall under a serious threat by modern empirical philosophy. Kant thinks, all mathematical judgments, without exception, are synthetic. He also thinks, the proposition, 'straight line between two points is the shortest' is a synthetic proposition. Logical empiricists reject this proposal outrightly. They think that all mathematical propositions are *a priori* and necessary, so they are analytic.

observations would lead him, under certain conditions, to accept the proposition as being true, or reject it as being false.'[295]A.C Ewing writes, 'A meaningful proposition is a sentence which expresses a proposition, a meaningless sentence is a sentence which express no proposition.'[296] What is proposition? Ayer defines as such, 'unless a sentence was literally meaningful it would not express a proposition, for it is commonly assumed that every proposition is either true or false, and to say that every sentence expressed what was either true or false would entail saying that it was literally meaningful.[297]So obviously, it means that any proposition which wants to express meaningful utterance must need to be a proposition. So, to avoid terminological difficulties Ayer prefers to call it *statement* for both meaningful and meaningless sentences. Now, the verifiability principle should be applied neither to sentence nor to proposition but to statement.[298]

This very idea and position of the empiricists are objected by almost all sections of philosophers. Especially, how can we determine the universal proposition of science from its conclusive verifiability? In reply, Ayer writes for *Meeting of the Aristotelian Society* in 1937 about the "Verification and Experience" that the customary answer to the question is, 'it is agreement or disagreement with reality.'[299] Here, the word "reality" may sometimes be substituted for "fact" or "experience" but Ayer has a different proposal for clear elucidation of those terms. He maintains that we need to draw a distinction 'between those empirical propositions whose truth or falsehood can be determined only by ascertaining the truth or falsehood of other propositions and those whose truth or falsehood can be determined directly by observation.'[300] Ayer thinks that the former classification belongs to all universal propositions. 'Gold is dissoluble in *aqua regia'* is a general or universal proposition which is not definitely a tautological composition; so the certainty of the proposition depends upon the entire particular proposition from which it has been inducted thereupon. This is factually preposterous to test all the gold in the world in order to establish the veracity of above proposition; no matter how many particular propositions are taken together in order to succeed in

[295]Ayer, LTL, p.16.
[296] A.C. Ewing, "Meaninglessness," inMind, 1937, p.347.
[297] Ayer, *Language, Truth and Logic*, Penguin books, England, 1946, p.172.
[298] In the second edition of *LTL* Ayer wants to avoid the difficulties which he has embarked upon in the first edition. In the later edition he writes,' the solution that I prefer is to introduce a new technical term; and for this purpose I shall make use of the familiar word 'statement', though I shall perhaps be using it in a slightly unfamiliar sense. Thus I propose that any form of words that is grammatically significant shall be held to constitute a sentence, and every indicative sentence, whether it is literally meaningful or not, shall be regarded as expressing a statement.' pp. 174-175
[299]Ayer, *Meeting of the Aristotelian Society,* 55, Russell Square, London, W.C.I, on April 26th 1937 at 8 p.m.
[300]*ibid.,* p.137.

establishing this. Accordingly, *leap of induction* becomes the most irritating carbuncle for philosopher of science. Popper has approached for an alternative proposal which is created, I believe, for the cavity in inductive generalization. This is the falsification theory which is proposed ultimately for the failure of inductive generalization. Popper, for the growth of scientific knowledge, does not really depend upon the analysis of scientific language. Historically, philosophers who are really concerned about the growth of scientific knowledge do not care about the epistemological haziness. Therefore, in the preface to *The Logic of Scientific Discovery* he expresses his motive to think about the epistemological problem in scientific knowledge, and writes; 'I have tried to show that the most important of the traditional problem of epistemology—those connected with the growth of knowledge transcends the two standard methods—of linguistic analysis and require the analysis of scientific knowledge. But the last thing I wish to do, however, is to advocate another dogma. Even the analysis of science–the 'philosophy of science' is treating to become a fashion, a specialism, yet philosophers should not be specialists. For myself, I am interested in science and in philosophy only because I want to learn something about the riddle of the world in which we live and the riddle of man's knowledge of that world. And I believe that only a revival of interest in these riddles can save the science and philosophy from narrow specializations and from an obscurantist fail in the expert's special skill..'[301]

Here, we will examine verificationism as a criterion of linguistic meaning. We will consider a good number of objections brought against this theory. And, we will propose some alternatives later on.

a) The principle of verifiability, on the face of it, is neither an empirical generalization nor a tautology. What, then, is its status?[302]This question turns out to be highly problematic. How a theorem is constructed in natural science or social science in a view to explain the world? In natural science, all theories built up under the circumstances of general classification and here, the principle of verifiability is nothing exceptional to that of the very ideas. I am sure; the principle of verification is not tautology or *a priori* in nature or even not necessary like mathematical and logical propositions. When the positivists accept general proposition as probable and concedes those as not conclusively verifiable so there is no question of being tautological. Further, where there is a proposal of verifiability *in principle,* therefore, nobody can be ascertained about the self-

[301] Karl Popper, *The Logic of Scientific Discovery*, p.
[302] John Passmore, *A Hundred Years of Philosophy*, Penguin Books, 1966, p. 369.

righteousness of the principle. Finally I hold that it is a proposed theorem like other theory of social science and epistemology among many others in our cognitive domain what I conceive it as very plain and naïve in character. And this is of course a methodological principle.

b) We ordinarily inquire into the meaning of words or sentences. A proposition is what a sentence means, not something that *has* a meaning. On the other hand, it is proposition which we verify, describe as true or false. How, then, can verifiability be identified with meaning?[303]Before meeting this objection, I will say that verifiability principle is a proposal which is formulated *only* to determine whether a statement is meaningful or not; not exactly explore the meaning of those statements which they stand for. It will never speak about the meaning of a proposition (statement) or what does it refer to. What is the meaning of the statement X? or Whether X is meaningful – are two different propositions which have different asking. It is categorically demanding what exactly the X means for the former case and for the later, it is only asking whether it is meaningful or not. Here, positivists are only satisfied with this later formulation. What do you understand by the proposition 'mammals are breast feeder' and the statement mammals are breast feeder is meaningful? are two different questions. They are not interested to inquire the *exact* meaning or logical import of the statement but to propose plainly whether it is fact-stating or not. Therefore, the critics must be advised not to think highly of its meaning-rendering import. This principle can only be identified with the meaningfulness not the meaning it contains. In this sense, this principle disheartened the verifier

c) Propositions may be unverifiable either because we cannot, for the moment, think of any way of verifying them, or because it is physically impossible to verify them or because any attempt to verify them is ruled out for purely logical reasons. Which of this species of unverifiablity carries meaninglessness with it?[304] It has been clarified emphatically that if any statement does not have the quality to be verified either physically or practically or at least in principle, it turns to be meaningless. In addition, if any conclusion fails to address logical inference it must not have cognitive value however strong the statement is. So, purely logical reason along with psychological

[303] *ibid.*, p.369.
[304] *ibid.,* p.369.

correspondence with facts both involve in the operation of verifiability. Metaphysics does not fit with both the reasons, so they are rejected.

d) The principle of verifiability leads towards ultimate verifiers. If a proposition's meaning consists in what verifies it, these 'verifiers' cannot themselves be propositions; or alternatively, they must be propositions whose meaning somehow lies in themselves. What are they?[305]This question has exhausted the positivists much than any other issues at this stage. This principle ultimately leads to the verifier and since the verifier cannot be the proposition so how can we ascertain about the authenticity of the given proposition? I think, this question becomes very relevant here, who will be the ultimate verifier? How can we, at the last stage, rely on someone who will advocate the truth or falsity of propositions? Is it verifiability- by-me or verifiability- by-someone or verifiability-by anyone? In *Language, Truth and Logic* Ayer proposes for verifiability-by-me. But, the case becomes complicated when someone says, 'I am in pain.' Is the pain of other's stomach is metaphysical to me as it is unverifiable? Ayer changes his position in the second edition of LTL published in 1946 and adopts 'behavioristic' account where he includes other man's experience. Now, he takes that, 'it is not logically inconceivable that I should have an experience that is in fact owned by someone else'; and from this I inferred that the use of 'the argument from analogy' might all be justified.[306] I think the critic might not be convinced of this above reply. Answer might be unconvincing but the fact is that the positivists at the final stage refer to the ultimate verifier who is entitled to declare its acceptability.

Now, we will try to understand how the criterion of meaning is formulated with the advent of new criticism.

5.6 Proposition about past, future and other minds

It becomes very difficult to speak about the proposition of past and future and also about other minds. What is the method by which one can determine historical facts or future event as well? Ayer makes the comment, 'statements about the past may be verifiable in the sense that when they are conjoined with other premises of a suitable kind they may entail observation-statements which do not follow from these other premises alone; but I do not think that the truth of any observation-statements which refer to the present

[305]*ibid*, p.369.
[306]*LTL*, p.190.

or the future is a necessary condition of the truth of any statement about the past.'[307] So, what is the solution to Ayer? Just following the paragraph he writes again. 'this does not mean that, however, that propositions referring to the past cannot be analyzed in phenomenal terms; for they can be taken as implying that certain observations would have occurred if certain conditions had been fulfilled.[308]He has clarified this position in *The Foundations of Empirical Knowledge* and says, '… for example, the application of the principle to propositions about the past. It might be argued that since I cannot now observe any past events, I can only attach meaning to propositions which seems to refer to the past if I interpret them as referring to a set of experiences which I could obtain now, or in the future, these experiences being such that would ordinarily be regarded as indirect evidence for the truth of the propositions in question.[309]Lastly, he says, 'And from this I conclude that if one is justified in saying that events which are remote in space are observable, in principle, the same may be said of events which are situated in the past.'[310] Ayer's position is critically exposed by the critics as follows: 'we may, however, retort that professor Ayer in applying the verification principle to statements about past events, is backing the wrong horse; for though the things in remote points of space exists, to be observable in principle, events in the past are no longer there to be observable in principle. Shall we invent the Time-machine of the imagination of H.G. Wells to hurl ourselves back into the past?'[311]

It can be assumed that why does Ayer accept the verifiability principle of Ryle's version. Ryle's suggestion about the principle is something new where he proposes that all non-analytic statements should be taken as meaningful if and only if it is verifiable by someone or other living, dead or (presumably) unborn.[312] This is to be noted that Ayer takes the position because of the fact that if anything happens at a moment are quickly passing away and constantly rushing away behind our sense. So, that could never be remained untraceable from my elbow. When I started writing my passage early in the past year it becomes fairly past and at a certain point of time in the future this will be gone as an ancient deed. When someone describe past events from his memory or from historical notes, he narrates either from his sense-data or from a description he once acquainted with indirectly. This follows that we never abandon the description or

[307]*ibid,* p.189.
[308]*ibid*, p.189.
[309] A. J. Ayer, *The Foundations of the Empirical Knowledge,* The Macmillan Press Ltd, p.111.
[310] Ayer, LTL, p.189
[311]SibapadaChakravarti, *Analysis and Philosophy*, Rabindra Bharati University, Calcutta, 1982, p.79.
[312] G. Ryle, "Unverifiablity by Me" in Analysis, Vol. 4, No. 1[The quotation is taken from the book of Sibapada Chakravarti, *Analysis and Philosophy*, Rabindra Bharati University, Calcutta, 1982, p.79.

reject those narrations for an accusation of other mind's descriptions. So, verifiability-by–me gradually shifts from solipsistic preponderance to verifiability-by-anyone. Ayer has intensified this suspicion when he speaks about private language. He writes:

'I conclude, first, that a person to use descriptive language meaningfully it is not necessary that any other person should understand him, and, secondly, that for anyone to understand a descriptive statement it is not necessary that he should himself be able to observe what it describes. It is not even necessary that he should be able to observe something which is naturally associated with what it describes, in the way that feelings are associated with their 'natural expressions'. If we insist on making it a necessary condition for our understanding a descriptive statement that we able to observe what it describes, we shall find ourselves disclaiming the possibility of understanding not merely statements about other people's private sensations, but also about statements about the past; … No doubt it is a necessary condition for my understanding a descriptive statement that it should be, in some way, verifiable. But it need not be directly verifiable, and even if it is directly verifiable, it need not be directly verifiable by me.'[313]

But, the risk of shifting from personal account to public would have been dangerous and eventually brings the stigma in the basic spirit of the principle. If the principle is thought to be equated with verifiability-by–anyone; the positivists might have been demoralized to challenge metaphysicians about his mystic experience.Metaphysicians always demand an extra-sensory experience and highly private experience in this regard which can never be an issue of public enterprise.

I will extend my discussion with more objections brought against this principle.William G. Lycan discusses about some serious objections against verifiability principle in his *Philosophy of Language* in which he replies some of them.

O B J E C T I O N *I*[314]

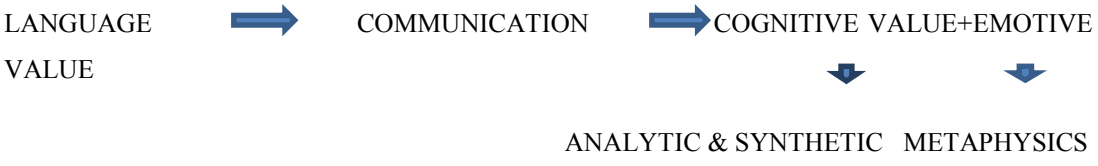
First attempt is made with reference to Wittgenstein who is envisaged as the procreator of the principle. It is said thatWittgenstein accused the principle as a *monolithic* attempt

[313] Ayer, *The Concept of a Person and Other Essays*, Macmillian and Co Ltd, New York, 1964, p.51.
[314] W.G. Lycan, *Philosophy of Language,*Routledge, New York, London, p.101§§ All the objections (1-5) are taken from the above book in which some of the speeches are taken down from his original speeches and some are formulated by me . So, I have used the note mark at the above point of objection 1, objection2, objection3, etc. I have also added my own views and againstthose objections.

to get the "essence" of language and Lycan believes that all such attempts are doomed to failure. This is very commonly held that this theory is proposed only to justify descriptive or fact-stating language. But, Lycan along with many philosophers strongly hold that fact-stating language is only one kind of language and there are huge numbers of languages which are mostly used in question, orders, poems, jokes, ceremonies of various kinds. An adequate proposal of a principle would have been extended so that it could cover all those areas of human thoughts and feelings. The word "meaningful", here, is used in ordinary sense of the term which seems to be defective.

R E P L Y

Lycan's reply needs to clarify with much more arguments. It reminds us that every language has one purpose; just to communicate with others. This communication has many purposes: provoke human senses, make fun, make order or command, and of course generate *knowledge*. This question remains unsettled among the philosophers which languages are responsible for generating knowledge? What I believe is that there are many languages in our everyday functions which are equally important as like as cognitive exasperations. But, it should be remembered that all the terms do not carry the same values to the people regardless of their conceptual height. Logical empiricists never reject metaphysics as completely meaningless; they only disown metaphysics in an accusation of devoiding itself of cognitive meaning. Ayer says about metaphysical sentences that' This sentence expressing it may be emotionally significant to him'.[315]So, "cognitive" value of a sentence in no way should be equated with "emotive" value. Lycan assumes that this "restriction" to meaning theory for anti-metaphysical purpose is charged with damaging linguistic philosophy. I should make the classification, here, about the purpose of language and its practical uses.



[Cognition refers to only sense-experience]

I therefore, think that since the positivists make their judgments only about the cognitive meaning of statements not of its emotive value, so this objection against the principle

[315]Ayer, *LTL*, p. 16.

must not get its full seed as it is usually happened to be. Let's think about the second objection.

O B J E C T I O N*2*[316]

Positivists were working with admittedly preconceived ideas of which strings of words are meaningful and which are not. According to the proposed structure of the principle it is conceived that if something does not collide with the principle it is taken to be meaningful and if it does it is meaningless. This objection is mainly formulated against the principle that asks which strings of words are thought to be meaningful. We must need to know the meaning of sentence or what the sentence says. Before that, how could we know whether it was verifiable unless we know what it says? Lycan asks, if we want to verify the presence of virus we need to know, first, what virus is or where it is to be found or the characteristic of virus as well. So, he says, the question of verifiability and verification conditions is conceptually posterior to knowing what the sentence means; it seems we have to know what a sentence means in order to know how to verify it. But, Lycan believes, that is just the opposite of what the Verification Theory says. Besides, he opposes the ideas of so-called divisions between meaningful and meaningless strings of words that make a sentence. "Everything has just doubled in size", "The entire physical universe came into existence just five minutes ago" and "wgfijsdkhjjiobfglglfud", "Good of off primply the a the the why? " two sets of sentences which he differentiated as meaningful and meaningless according to the positivists. He argues that according to the rules of principle former set of sentences would be meaningful. Finally, he thinks that former strings are not meaningless in the same drastic and obvious way as the latter.

R E P L Y

I have replied earlier almost same objections (§b) of John Passmore. Now, I think it needs more elucidations at this point to make it understandable. It needs to remember that, Verifiability principle is 'supposed to furnish a criterion by which it can be determined whether or not a sentence is literally meaningful.'[317]I think, as a criterion of meaning it is insufficient because it takes the responsibility only to bifurcate all sentences – whether it is meaningful or meaningless. And, meaningfulness is only

[316] W.G. Lycan, *Philosophy of Language,*Routledge, New York, London
[317]Ayer, *LTL,* p.171.

determined according to having the merit of being observatory status and not anything else. According to that point of view, it is reluctant to ask the meaning of sentence for itself. Very precisely, it does not explore the meaning of sentence; just it asks, 'is the sentence fact-stating?' It does not express the interest what fact it contains thereafter?If the answer is "yes", it is identified as meaningful and if it is "no" it is simply overthrown. 'Every extended body has three dimensions' is a sentence (or statement) which is asked if it is meaningful or not. But the answer about the status only is extremely dissatisfactory. I am sure; this will never be the proper and sufficient meaning. So, Lycan is correct in that sense. But he does not notice another side of his objection.

Positivist says, two conditions need to be fulfilled in order to be meaningful sentence. One, it must be grammatically sound, two, it must represent fact. Suppose, 'A and B are two years senior to each other', or, 'He is junior to' or, 'Everything has just doubled in size' are the sentences which are grammatically unsound though its sentence constructions are almost correct. So, at the outset, these can be rejected. But, another sentence, Lycan, mentioned, 'The entire physical universe came into existence just five minutes ago' is grammatically correct but not true. I believe, this sentence is not meaningless although it is false. It should be remembered that the condition was that it must be either true or false in order to be meaningful. Therefore, these strings of words are not contra-factual and thenceforth they are meaningful.

O B J E C T I O N 3[318]

We have discussed much about Lycan's objection number 3 where he puts some arguments and finally placed some questions against the principle. I have got similar objections in Scott Soame's classical note *Philosophical Analysisin the Twentieth Century* (Vol.1). Summary of Lycan's objections may be put as such: since all "observation language" restrict itself to the vocabulary of subjective sense impressions, so how can we get rid of solipsism in order to provide objective knowledge. Again, if we think about "directly observable characteristic" of ordinary object, it remains true that verificationism collapses a sentence's meaning into the type of observational evidence we can have for that sentence without *remainder.* Besides, he questioned about the strategies and methodological approaches of verifications. Truly, we depend upon apparatus or tools to identify the secrecy of causes. Almost similar questions were put

[318]Lycan, *Philosophy of Language*, p

forth by Scott, *Observable by whom? Observable by what means?*[319] Scott writes, whether or not observations involving magnifying glasses, binoculars, telescopes, microscopes, radio telescopes, electron microscopes, and the like should be counted as observations for these purposes is something we will not stop to puzzle over.[320]

R E P L Y

During the time of Mach it was very difficult indeed to trace out electron because electron was microscopic particle. It is known that, Mach was an orthodox empiricist who didn't believe anything behind human experience. Due to his unwitting thought, Boltzmann, his successor of the post, did not acknowledge his contributions. Actually, Mach had to pay the price for his immature ideas about the structure of atom. Later, scientists were acknowledging the fact that there can be something real beyond our unaided sense. With the advent of new ideas in physics it is unsuspiciously taken that human senses have limitations at least to its accuracy to detect the fact or truth. I am sure, nobody now thinks about the presence of electricity in a wire even though it can't be observed by bare eyes, however, in fact, the surest way to detect its presence is known to us. The question is thus important for the positivists, how can we depend upon our unaided sense? I am fully agreed with Lycan that they did not consider this instrumentalism grotesque which is believed to be importantly true.

O B J E C T I O N 4[321]

I guess that Lycan is influenced by Hempel's article *The Empiricist Criterion of Meaning,* especially from the section of "The Logical Status of The Empiricist Criterion of Meaning". Hempel asks 'what kind of a sentence, it has often been asked, is the empiricists meaning criterion itself?'[322] Lycan in his objection here raises almost the same question: How does the principle of verification maintain its status? Either *it* is empirically verifiable or it is not. Hempel thinks 'it is not empirical hypothesis; but it is not analytic or self-contradictory either; hence, when judged by its own standard, is it not devoid of cognitive meaning? In that case, what claim of soundness or validity could possibly be made for it?'[323]

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[319]Scott Soames, *Philosophical Analysis in the Twentieth Century* (Vol.1). Princeton University Press, 2003, p.276.
[320]*ibid,* p. 276.
[321]Lycan, Philosophy of Language.
[322] Ayer, LP, p. 123.
[323]Ayer, LP, p.123-124.

We can think both of the possibilities about the status of the principle—analytic and synthetic. Suppose, it is analytic and it is not verifiable. What can we think to be happened then? There are two options – either it is meaningless or depends on only definitional truth. At least one positivist may think that the principle is just meaningless, a ladder to be kicked away once one has climbed it. Some other positivist holds that it was a useful stipulate definition of the word "meaning" for technical purposes. Hempel calls it a "proposal" so it is neither true nor false, but subject to each of the several rational demands and constraints, hence not simply *arbitrary.*

Suppose, if the principle *is* taken to be empirically verifiable. That is, assume it is supposed to be confirmed by our experiences of sentences, their meaning, and their verification conditions, and meaning has been found to track verification condition. But, that presupposes that we can recognize sentence meaning independently of assigning them verification condition. And it is not clear just what we should count as the "empirical" data on which this principle is based.

R E P L Y

Among many other critics I believe that this principle which is proposed to determine meaningfulness of sentences is actually a *truth value* of statement.[324]It is not admitted by the logical empiricists that there is a distinction between meaning of a statement and truth-value. In many cases it is proved that logical empiricist has taken their criterion as a synonymous with truth-condition. Lastly, I am agreed with Hempel about the status of this principle. He writes, 'As a consequence, the empiricists criterion of meaning, like the result of any other explanation, represent a linguistic proposal which itself neither true nor false.'[325]Lastly, this can never be denied that it has a long consequence and at least two of them are to be mentioned here for our purposes: 'first in the sense that the explication provides a reasonably close *analysis* of the commonly accepted meaning of the explicandum—and this claim implies an empirical assertion; and secondly, in the sense that the explication achieves a "*rational reconstruction*" of the explicandum, i.e., that it provides, together perhaps with other explications, a general conceptual framework which permits a consistent and precise restatement and theoretical

[324]SibapadaChakravarti, *Analysis and Philosophy*, RabindraBharati University, Calcutta, p. 92.
[325]Ayer, LP. p. 125.

systematization of the contexts in which the explicandum is used—and this claim implies at least as assertion of a logical character.[326].

O B J E C T I O N[327] 5

This objection of Lycan comes forth on the basis of Duhem--Quine thesis[328]. W.V.O Quine argues that it is virtually absurd to verify an individual sentence because he believes that individual sentence has no distinctive verification condition. It was a plain idea of common people about science that scientists put forward hypothesis and test the proposed hypothesis whether it works with reality or not. If it does, it is taken as a correct theory. But, for Duhem as Lycan says, in the history of the universe there has never been an experiment that could singlehandedly verify or falsify a hypothesis. This is the most fundamental question in scientific knowledge, how scientist finds out actual theory for his purpose among many others auxiliary assumptions. In many cases, a scientist had to reject one hypothesis, accept partial assumption and finally makes the right way. In practice, when we approach to an astronomical study through a complicated telescope, we need to verify and falsify so many contending issues for the sake of accuracy. It is assumed that, until we are getting the actual theory we need to rummage all other possible optical hypotheses in a row.

In our everyday life, we should not be confirmed about all the things around us whether they are actually real. This skeptical assumption is as old as philosophy. We learn to know that in every situation it needs to consider the verification conditions. In what environment the verifiable-content is being provided for us, that needs to take into consideration. Suppose, if I want to verify or falsify a sentence like "the fragrance of the red flower is very sweet", it is virtually not an easy way to check it out. It needs to be sure that the verifier is ready with his sound sense, nose, eyes, etc. and there is no transparent glass between the verifier and the flower along with many other conditions. Lycan concludes by saying that we need to take "the" verification condition for a given empirical statement presupposes a massive background of default auxiliary assumption. But, he apprehended that if we don't consider all other things and take only one assumption for our purpose this aim of the correct formulation may fail.

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[326]Ayer LP.p.125.
[327]Lycan.p.105.
[328]Duhem--Quine thesis is usually known as Duhem- Quine problem which reveals that it is impossible to test a single scientific hypothesis in isolation. It also demands that we need one or more auxiliary hypotheses or background assumption in order to build up a genuine theory. If we want to justify the thesis made up from the contending hypothesis, obviously, we need one or more hypotheses at the same time.

R E P LY

Is the Positivist skeptic? Shouldn't be we skeptical about the verifiable content? I strongly believe that there must not be any single knowledge about the external world which cannot be challenged in any way. We can be free from epistemological haziness in no way—neither in belief, nor in memory, nor even our daily assumption. Imagine a single sentence about any belief regarding the external world which is free from doubt at least in partial. This will never be found if it takes hold about the empirical world. This objection is completely justified because the history of science and its methodological approaches support this content. Duhem-Quine thesis is entirely based on the scientific fact. But, the issue does not end here because it needs further elucidation particularly for the purpose of the positivists in which they wish to end up the issue.

Positivists turn away from logical to psychological, so the critics find their easy way to criticize positivistic project. Positivists, at the outset, criticized Hume[329] for taking the whole matter (metaphysical issue) as a psychological issue and they also criticize Kant[330]. But, they shifted from their earlier position and mix up with psychological factor invariably. If they would stick with logical factor only it wouldn't have been an easy task to make the criticism. There would not have been any question of single-sentence-verification case as it has been presently reproached. Moreover, I think every given sentence have got the merit to be verified by senses and here, there should not be raised any question of contending hypothesis. Quine's hypothesis and positivist's single sentence are not logically same. Suppose, 'the Venus is a planet that is seen both in morning and evening', and 'this sunflower is yellow'--are two different sentences that need to be verified. How can we go for this verification? Yes, there is a huge complication before setting up a hypothesis that morning star and evening star though it is seen differently at different point but it is the same, and that is Venus. For the case of sunflower, I think, the issue is quietly different to that of the previous one. Doesn't the skeptic believe that this sunflower is yellow? If not, so why does not he say about the sentence as'I suspect that this sunflower is yellow'. Accordingly, he may add for every

[329] Ayer takes the Humean empiricism as a psychological factor. Hume says, all ideas come from impression. But, he thinks that this is not the case of psychology of matter of fact but the whole thing is to be considered as logical issue. Our question against the metaphysicians is that is not our understanding venture to intrude where it is unwarranted but it may be right to put s thus the metaphysicians play with language which is logically unfiltered.

[330] Ayer writes, Kant also condemned transcendental metaphysics, he did so on different grounds. For he said that human understanding was so constituted that it lost itself in contradiction when it venture out beyond the limits of possible experience and attempted to deal with things in themselves. And thus he made the impossibility of a transcendent metaphysics not, as we do, a matter of logic, but a matter of fact.(LTL,p. 14.)

sentence as "I suspect". But, virtually he does not do that. Lastly, I find that the case of single sentence verification depends on some conditions that do not follow that the verifier needs to consider other default auxiliary assumptions. To consider, 'the sunflower is yellow' one does not take into account (provoked by Quine) that there are different types of follower in the garden but which one is sunflower I don't know, so, I shouldn't comment on the issue. Moreover, I don't know the definition of yellow or it is not easy to make difference between yellow and light-reddish. Yellow means yellow. Red is red. If we don't have the idea of yellow and red we can't make any judgment about yellow and red. At least, we need to agree on some basic point, however big skeptic one may be, for knowledge construction or at least every day functions.

In his paper "A Defense of Epistemic Verificationism"[331]Stephen P. Schwartz's has defended the Variability Criterion of Meaningfulness (VCM) on three special grounds. Firstly, he outlines the motivations of the positivists, secondly, he proposes an alternative to VCM, thirdly, his proposal will address, as he believes, crippling objections against the project.

What is the aim of the positivists that they want to get by applying VCM? Their aim is to defend non-analytic propositions and to prove it to be different from metaphysics. By this way, the positivists get into serious trouble when they encounter with non-empiricists. Stephen argues that all non-analytical propositions are "based on experience."There might have been serious discontent among the empiricists about the knowledge based on experience. But, finally nobody can disagree that 'there is no possibility of knowledge based on pure intellectual intuition, pure reason, recollection of platonic forms, mystical insight, or anything that is claimed to be entirely independent of the senses and introspection into our own mental contents.'[332] There might have been discontent over many issues among the logical positivists but everybody will agree that, 'there are no non-analytic propositions that can be known *a priori* '[333]. Stephen is mistaken here to announce that, metaphysician would not dispute about an event that their assertions were not based on experience. Metaphysicians do not reject the function of experience but they always speak about different kind of experience which is branded by theologians as mystic. I will remind here a peculiar kind of verifications pronounced by the religious man. John Hick has placed an idea

[331] Stephen P. Schwartz, "A Defense of Epistemic Verificationism", Itacha College Webpage, New York, USA,
[332]*ibid*, p.3.
[333]*ibid,* p.3.

of eschatological verification[334] based upon Christianity and afterlife beliefs. Here he explained, how a religious mind can verify his self-proclaimed assertions.

Stephen proposes VCK instead of VCM. VCK stands for verifiability criterion of knowledge. He advocates for VCK as 'no proposition that is independent of empirical source of knowledge can be known to be true or known to be false'.[335] He demands that VCK leaves no room for rational belief or rational disbelief for in any proposition that is not based on empirical source of knowledge.'[336] But, the basic contention between empiricists and non-empiricists revolves rounds the fact that non-empiricists do not believe in such vindication. Non- empiricists do not disown the empirical data entirely for knowledge but they want to add more in addition to that data. So, here is the basic difference between empirical generalization and their oppositions. Stephen's third proposal was discussed while I was replying Lycan previously.

Lastly, I will sum up the whole discussion in which I will expose my own contention very briefly:

a) Principle of verification as a semantic principle is incomplete and fails to address all the objections brought against it. Even its modified version could not able to offer an alternative proposal for a suitable solution.
b) As a principle it is very flat and naïve. Although it represents the fundamental motivations of the empiricists but in large part it lacks substantial arguments.
c) Alternatively, their opponent equally fails to do justice properly, because science stands wholly on the basic principle: 'never accept something beyond verification' with very rare exceptions. So far, nobody can provide any supernatural principle to explain the world correctly. Science vows her championship. Present day science does not bend down against sub-atomic areas of particle where this area is usually deemed to be non-verifiable realm. Modern scientific researchers constantly pursuing very minuscule portion of sub-atomic areas to trace out the reality of the universe.
d) The criterion of meaning poses a serious threat to speculative philosophy, at least for some decades, not only for its logical character but also for the fragile basis of metaphysical foundations itself.

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[334] Hick believes that, "verifiable" means "publicly verifiable". But it does not follow that a given verifiable propositions has in fact been or will in fact ever be verified by everyone. The number of people who verify a particular true proposition depends upon all manner of contingent factors. *Philosophy of Religion*, Prentice-Hall Pvt. Ld. New Delhi, 1997, p. 104.
[335] Stephen, p.4.
[336] *ibid*, p.4.

6.
LOGICAL EMPIRICISM AND CONTEMPORARY DEVELOPMENT

In this chapter I will discuss about the post-positivistic reaction as a philosophical thought that are, in any way, developed within the structure of positivism. Post-positivistic reaction eventually responded with some later philosophical developments like Paul Feyerabend's epistemological anarchism, Karl Poppers' principle of falsifications, W.V.O Quine's holistic empiricism, T. S. Kuhn's holism in epistemic justification, social constructionism, Van Fraassen's constructive empiricism and others. All these philosophical developments are in a particular way reacted with a sense, unlike positivistic stand, that all philosophical theories regarding epistemology or social context must be constructed holistically. It is also argued that theory can't be constructed in isolation because observation and theory are fundamentally different. It is different in such way that observation is a preliminary stage of theory-construction as like buying a whip before horse. However, S. Hawking in very recent time rejects the so-called difference between these observation and theory. He sees no difference between these two because, he believes, theory is a inductive construction of so many instances of particular cases.

Basically, observation and theory are different in their precision and degree of systematization. Accordingly, post-positivistic development in philosophy revolves round two fundamental questions: a) Is scientific theory built up within the purview of observation or experiment alone? b) if not, then what does it follow to recount its meaning? Undeniably, later philosophical thoughts are proceed with the protest against the reductionism of logical empiricism. However, I think, it needs to recapitulate the idea whether the extension of those methods do have any link with observation. I do not see any reason to make any fundamental cleavage between theory and observation. Observation finally makes the theory that is developed within the fact. Obviously, theory is an advanced process of observation that replies many questions to reach a satisfactory answer. When once a theory is established it naturally follows that same occurrences may happen repeatedly without exception. If, in fact, any other exceptional case of observation appears on the way to theory it instantly demands to reject or to revamp the whole process. Therefore, the relation between observation and theory is inseparable and undistinguishable. An observation is always thought to be an act of

sense occurrences that is private in nature. However, theory on the other hand is objective, coherent and internally consistent .No theory is built up without evidence and test that ultimately points to the human sensual act. Dialectical materialism is a social evaluation theory, for example, that explain the nature, social act, and society itself on the basis of social observation as the heliocentric theory of the solar system which explain the collocation of planets and the sun on the ground of human long perception and insightful observation. It is obvious that observation and theory don't stand as opposed to each other but on the contrary it approves each other with definite reciprocal references.

It should never be denied that scientific knowledge is always corrigible. In one sense this knowledge is limited in terms of its future journey. The physics of 17^{th} century, thus, is limited in terms of 18^{th} century; similarly this physics is also limited in terms of its later thoughts. This is the nature of scientific knowledge that correctness and precision of knowledge is a constant process. As a matter of fact, science always leaves room for further improvement in order to have more accuracy and finding new area of exploration. In addition, the improvement and precision of scientific knowledge goes step by step like an escalator as a collective effort. As a result, single step of scientific knowledge ushers in more complicated form of advanced ideas. For example, Maxwell's electromagnetism describes how electric and magnetic fields are generated interchangeably and he brings these two different fields in a single platform. To compile the equation, Maxwell uses different knowledge of physical nature which was a gradual amelioration of previous scientific thoughts. Similarly, Einstein is greatly indebted to Lorenz-Fitzgerald contraction hypothesis for his relativity theory. As a result, science has no ends whatsoever. On the other hand, it is true at the same time that many scientific inventions did follow very little way of fixed method. The invention of the structure of Benzene (C_6 H_4) marks the most interesting foot-step of scientific dream. The fantastic quip[337] of Auguste Kekule (1829-1896), famous German chemist, about the scientific invention turns down the wheel of scientific method. This very cleavage of scientific method makes ample room for critics. Critics are often convinced to understand that science always plays on wrong foot. Moreover, the certainty of scientific knowledge is always lies in vulnerable state because science does never claim absolutism. Again, Induction increases the uncertainty further. The problem of induction is known to both the parties—science and its critics. I may put here my opinion that this

[337]AugusteKekule's famous quip about the scientific invention: let's try to learn dream gentle man and then perhaps you will get the truth.(1999).

drawback of science possibly picked up by Karl Pooper and Paul Feyerabend with their sharp knives. Now, let's move to the follow up.

Before going to conclude my last speech I will share some important notes of Allan W. Richardson about the reappraisal of logical empiricism and its role in analytical philosophy. Richardson[338] writes,

> There are, no doubt, many reasons, but a few stand out as the important ones. First, perhaps more than any other aspect of analytical philosophy, logical empiricism did dominate its fields of endeavor—principally philosophy of science—for a very long period. Logical empiricism provided the working framework of most philosophers of science from roughly the 1930s to 1960s. Moreover, the issues place at the heart of philosophy of science by the logical empiricists—the analysis or explication of important scientific and meta-scientific terms (confirmation, explanation, and so on)—continue to play a major role in philosophy of science, even as criteria of analytic adequacy change. It would not be too great an exaggeration to claim that philosophy of science as a discipline distinct from epistemology would not exist without the impetus of logical empiricism.[339].

6.1 Popper and the negativism of science

Karl Popper's approach to science in general and logical empiricists in particular is rather negative because of his very tactic to demarcate between science and metaphysics. It is really difficult to understand the difference between these two, particularly, on a certain point where science very narrowly escapes from metaphysics. He proposes that '*the refutability or falsifiability* of a theoretical system should be taken as the criterion of demarcation.'[340] Thus, it is out rightly rejected the principle of verifiability; however, instead, he proposes the so-called falsifiability as a criterion of

[338]Professor at the University of British Columbia, Canada and co-editor of Origin of Logical Empiricism(Minnesota Studies in the Philosophy of Science, XVI, University of Minnesota Press, 1996, V.16, Minnepolis, London).p.1

[339]Alan explains, the dominance of logical empiricism was greatly facilitated by the early volumes of Minnesota Studies in philosophy of science. Thus, it has been a matter of considerable poignancy for contributors to the volume that it appears in the same series.

[340]K. Popper, *Conjecture and Refutation,* p. 256

demarcation. As a result, I believe, he makes the same mistake by proposing his new idea in the place of old. Yes, it is really hard to go for endless tiresome process of inductive testing. It doesn't really mean that it is impossible to find the difference between science and metaphysics. Popper holds, 'I stressed the fact it would be inadequate to draw the line of demarcation between science and metaphysics so as to exclude metaphysics as nonsensical from a meaningful language.[341] I strongly hold that Popper fails to understand the real sense of the meaning of metaphysics as the empiricists do. That is the difference which becomes the center point of contention.

Of course, the degree of attestability, here, increases its probability. Accordingly, similar case happens for the principle of falsifiability because it is also an endless pursuit. As a regular attendant in the Vienna circle meeting Popper didn't have any sympathy to the positivists, instead he proposes an alternative to the principle of verifiability. He doesn't believe in any process of empirical generalization that is famously called the theory of induction. He says, 'Now in my view there is no such thing as induction. Thus inference to theories, from singular statements which are 'verified by experience' (whatever that may mean), is logically inadmissible. Theories are therefore, *never* empirically verifiable.'[342] Popper seriously thinks to make the demarcation between empirical science and non-science. So, he seeks after a criterion in the domain of empirical science even statements which cannot be verified. He further writes, '… I shall certainly admit a system as empirical or scientific only if it is capable of being tested by experience. These considerations suggest that not the verifiability but the falsifiability of a system is to be taken as a criterion of demarcation.'[343]

6.2Epistemological anarchism

Paul Feyerabend's epistemological anarchism appears as an acrid reaction against methodological monism. To Feyerabend, the growth of scientific knowledge never follows universal and fixed rules because the historical development of scientific knowledge is not unilateral in mode. Anarchism as a scientific method is defined here to be the champion of human epistemological pursuit. He starts his book by adding a very provocative opening statement: 'The following essay is written in the conviction that *anarchism,* while perhaps not the most attractive *political* philosophy, is certainly

[341] *ibid,* p. 257.
[342] K.Popper, *The Logic of Scientific Discovery*, p. 18.
[343] *ibid*

excellent medicine for *epistemology*, and for the *philosophy of science.*'[344] This very idea about science and scientific knowledge possess a threat to human freedom. Feyerabend claims his epistemological anarchism is humanitarian as he wants to lift the ban of methodological barrier within the structure. But finally, this very position about scientific method and science as well is untenable. This position can't be accepted for two reasons: one, in science 'anything goes' is supposed to be serious claim for science which is entirely unfounded, two, science doesn't allow an arbitrary mode of human exploration. He writes, '*…my thesis is that anarchism helps to achieve progress in one of the senses one cares to choose*. Even a law-and –order science will succeed only if anarchistic moves are occasionally allowed to take place.'[345] Therefore his *anything goes* principle is likely to dominate his whole philosophy of science. Noticeably, he doesn't make it clear what exactly means by the term anarchism. And, how anarchism possesses a similar note to that of his *anything goes* method.

Some main ideas about Feyerabend's philosophy[346] can be brought under following headings:

a) theoretical anarchism is more humanitarian;
b) the only principle that doesn't inhibit progress is: anything goes;
c) science should be advanced by proceeding counter-inductively;
d) proliferation of theories is conducive to science while uniformity impairs its critical reasoning;
e) need to come across the chauvinism of science etc.

It is very interesting to note that Feyerabend's approach to science and scientific history is rather frustrating and entirely negative. By using the term 'humanitarian' he tries to introduce the so-called freedom or individuality in scientific inquest. At the same time, he opines to add utmost whim in scientific research. As a result, science unfortunately comes down to the level of non-science. What, then, is the difference between science and non-science? Science is different from non-science on certain respective ground in which *method* is very important. Science is an attempt to depict the real picture of particular section of nature by the help of maximum usages of knowledge. Obviously, the trait of the knowledge is not only observable or experimental but also reflective. This reflective knowledge doesn't always follow the rules of justification. For certain

[344]P. Feyerabend, *Against Method* , p.17
[345]*ibid*
[346] *ibid*

reason, it sometimes needs to break the so-called boundary of scientific kingdom. Feyerabend attempts to fish in troubled water especially for the very rift in scientific history. Yes, there is a big question in science which is really perplexing: can science explain everything? I am not sure, here, about the answer of the question that all the people of science may agree over the issue. I believe that science can't do that and the man of science may not also hope to do so. Indeed, science is not a complete knowledge however it can explain the nature correctly. Actually, it doesn't do any harm to science; rather it is likely to be the beauty of science. The progress of science may not be daunted by accident. Feyerabend mentions good number of violation-cases in scientific research despite this violation, he thinks, it is not an accident.

Nevertheless, Feyerabend's rejection of methodological approach in scientific research doesn't able to do away with the very essence of science. It is very unclear then how scientific method opposes human freedom and research.

6.3 In reply to critics

With an especial reference to three important philosophical papers, Did Kuhn Kill Logical Empiricism?[347], Carnap and Kuhn: Arch Enemies or Close Allies?[348] and Is Quine a Verificationist?[349] on post-positivistism, I will try to make the analysis about the reaction of later philosophers on their previous development. Here I venture to prove that in spite of serious objections and challenges from some modern philosophers including physicist cum philosophy-writers[350], the importance of logical empiricism in present day still works as untainted fashion in some ways or another.

There had been a serious repercussion against logical empiricism—both logical and emotional—that counts the cause of 'sad demise' of this philosophical ideas. Alternatively, some philosophical tendencies were developed at the same time that actually defended this idea in a different manner. Van Fraassen's constructive empiricism or anti-realism is a modern development of empirical thoughts which closely stands with logical empiricism.

[347]George A. Reisech, *Philosophy of Science,* Chicago Journals, USA, Vol.58,No.2, (Jun.1991), pp.264-277,
[348]GurolIrzik and Teo Grunberg, *British Journal of Philosophy of Science,* 46(1995), p. 285-307.
[349]Pannu Raatikainen, *The Southern Journal of Philosophy* Wiley Online Library, 2003, Vol. XLI, p-399-409.)
[350] Someone may object that Kuhn was not a philosopher but a writer on philosophy of science. He describes himself as an ex-physicist now working in the history of science He does not have any sufficient idea about philosophy. The fact is that, his *Structure* is written as a part of a project of Neurath for their Encyclopedia.

His constructive empiricism announces to bring 'forward constructive alternative to scientific realism' (*Scientific Image*, p.5) I will discuss the issue at the closing section of the paper.

Prof. Steve Schwartz writes, 'The spirit of Logical positivism is still alive, perhaps a bit subdued, but still there.'[351] There is a strong whisper in modern day's philosophy that W.V.O Qunie and T.S. Kuhn have driven the last nail into the coffin of logical empiricism; therefore, all attempts to save this philosophy would have a similar attempt to awake a dead man! But, I think, this popular myth does not have any strong foundation except some methodological discontent and way of interpretations of scientific problems for which they were contending with.

George A. Reisch in his article, 'Did Kuhn Kill Logical Empiricism?' examines the relationship between *The Structure of Scientific Revolutions* and the philosophy of Rudolf Carnap and also how 'a *decisive* transformation' in philosophy of science had been taken place within this period. Reisch proves that Carnap didn't believe in any attempt of Kuhn which makes the challenges to his own philosophical views. Reisch writes, 'If Kuhn debunked certain tenets of logical empiricism(namely, a theory/observation distinction and paradigm-independent criteria of theory goodness) partly by suggesting that they were impotent to capture the reasoning involved in episodes of revolutionary scientific change, the fact remains that these tenets do not ground Carnap's view of revolutionary scientific reasoning.'[352]

6.4 Kuhn's challenge:

It is very difficult to understand on what particular point Kuhn preferably stands against logical empiricism. This difficulty arises, possibly, on the ground that Kuhn does not speak himself about the defects of empiricism outrightly though their philosophical ideas were juxtaposed without losing respective merits. But, it is assumed that the ideas of paradigm, scientific revolution and the crisis in science may provoke the critics to label him anti-positivists. In his book he explores how the human psychology takes the responsibility in accepting new scientific ideas. Moreover, he stresses to understand the history of science and

[351] Steve Schwartz, A Brief History of Analytic Philosophy: From Russell to Rawls, 2012, John Wiley and Sons, Ins, USA.
[352]George A. Reisech, *Philosophy of Science,* Chicago Journals, USA, Vol.58,No.2, (Jun.1991), pp.265,

its development where he categorically denied the complete knowledge of objectively reality. He believes, the history of science is not linear and accordingly, non-rational or non-empirical factor comes into fore.

Friedman exposes very essential point on what especial ground logical positivists differ from Kuhn. He writes, 'Conventional wisdom concerning twentieth-century philosophical approaches to scientific knowledge has held that Kuhn's theory of scientific revolution is diametrically opposed to the philosophical movement known as "logical positivism" or "logical empiricism". [353] Friedman thinks that since logical positivism is understood as a naïve form of empiricist foundationalism which only justifies the reduced scientific knowledge as a sense observatory so, there can't be something which is termed as a scientific revolution in Kuhnian sense. So, scientific progress must rather follow the "development-by-accumulation" model (in this case, development by accumulation of observable facts) that Kuhn explicitly rejects at the outset.'[354] On the other hand, from Kuhn part, the progress of science 'is marked by radical discontinues'[355] Friedman believes that this position of Kuhn is rather incompatible with the position of empiricism. Therefore, he writes 'so it is no wonder that Kuhn's theory of scientific revolution is standardly taken as a major factor in the demise of logical empiricism.'[356]

Besides, the assumption on logical positivism which ignores theory-observation dichotomy and the proposed demarcation between science and non-science also add to the motion. In addition, Kuhn sees the whole history of scientific development is a mistaken picture and he wants to correct those by giving a holistic picture. His 'historiography intends to show the arguments and beliefs of many historical figures are accordingly constrained by their paradigmatic allegiances.'[357] 'To buttress this historical argument, however, Kuhn offered psychological arguments against the notion that theories can simply be judged according to how well they fit the facts, or, for logical empiricism, according to their measure of empirical confirmation.'[358]

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[353] Michael Friedman, "Kuhn and Logical Empiricism,"[Thomas Nickles, (ed.) Thomas Kuhn, Cambridge University Press, 2003, UK, p.1.]
[354] *ibid*,p.1.
[355] *ibid*,p.1.
[356] *ibid,* p.1
[357] George A. Reisch, p. 267.
[358] *ibid,*p.267.

On different points Kuhn is supposed to be a critic of logical positivist's basic tenet. I will further add a long citation of George Reisch in which he shows that Kuhn prefers to get a holistic approach which virtually stands against logical empiricism. This is as follows:

> That is, for psychological reasons, he [Kuhn] claimed, a neat and clean theory/observation distinction—perhaps the central feature of logical empiricist models of theory – simply does not exist. Taking inspiration from Gestalt and "New Look" psychology, he argued that visual perception is a perhaps unconscious but necessarily active interpretive process (1970, 112-113; and f.n.I,2). One lesson of experimental psychology is "that two men with the same retinal impressions can see different things … [and] that two men with different impressions can see the same thing"(*Structure,* 126-127). For this reason, he ruled out the possibility of constructing a neutral observation-language "designed to conform to the retinal imprints that mediate what the scientist sees"9(*Structure,* 125). But his analysis also ruled out a language whose terms designate "perceptual feature" of nature, for "[t]hose features must obviously change with the scientist's commitments to paradigm"(*Structure*). And, leaving no logical empiricists unturned, he dismissed an empirical language of "concrete operations and measurements that the scientist performs in his laboratory"(*Structure*); they " are not 'the given' of experience but rather 'the collected with difficulty' " (*Structure,*126). Phenomenalist, physicalist and opertaionlist observation languages, he claimed, are necessarily non-theory-natural. Observations operations, and any language of them, belong only within particular programs.[359]

Reisch further argues that,

> If it were true that all visual perception is necessarily interpretive, that one's beliefs or expectations invariably inform the content of one's perceptions, then Kuhn would have a good argument with logical empiricism. Logical empiricist assumed that some distinction between theory and observation was workable. A good part of Carnap'swritings, for instance, concern the kind of language which will serve as an observation language and the kind of logical relationship that observational and theoretical terms exhibit. After all, empirical foundation of a theory manifest

[359]*ibid*, p.268.

> precisely in the way that it is supported by observable states of affairs. If the distinction were inadmissible, and a theory-independent observation-language was as well, the central epistemic goal of logical-empiricism—the development of models instrumental for clarifying the empirical justification of theoretical knowledge—would seem much less realizable.'[360]

Now let's think about Carnap's idea of scientific theories and how it takes a similar action to the idea of Kuhn's scientific revolutions. Carnap believes that scientific theories are mere languages. It actually comprises some vocabularies – both observational and theoretical, rules of language—of course logical rules and some sort of mathematics. Very clearly, Carnap expresses that it is not the function of scientists to refine or alter theory but on the contrary, they "change the truth value of an intermediate statement". Reisch announces in his paper that 'his[Kuhn] views about revolutionary scientific thinking are very much analogous to Kuhn's historically motivated picture of revolutionary science.'[361] Friedman explains Carnap's theory of scientific knowledge and Kuhn's ideas of scientific revolutions in which he proves that there is a close affinity between these two distinct views. He writes,

> The affinities between Carnap's philosophy of linguistic framework and Kuhn's theory of scientific revolutions are therefore pervasive indeed. According to Kuhn, there are essentially different kinds of periods in the history of science" periods of normal science in which the relevant community operates unquestioningly within a generally accepted paradigm "committed to same rules and standards for scientific practice" (1970, p.11) and periods of revolutionary science in which precisely such an underlying consensus is then undercut. Similarly, for Carnap, there are two essentially different kinds of activities associated with the linguistic frameworks within which our theories in natural science are formulated: the adjudication of internal questions on the basis of accepted logical rules of a single given linguistic framework and adjudication of external questions that by hypothesis do not and cannot presuppose such logical rules.'[362]

Kuhn in his book proves that it is the psychology of human belief that is mostly responsible for acceptance of a new concepts in science.

[360] *ibid*,p.269.
[361] Reisch, p.270.
[362] Friedman, "Kuhn and Logical Empiricism", p.6.

It is known or at least partially known to the reader of the post-positivists philosophy that Carnap and Kuhn became an arch-rival to each other over many issues of scientific reasoning especially logical positivist's views on science. Gurol Irzik and Teo Grunberg proves that '[a]lthough the popular myth has it that Rudolf Carnap and Thomas Kuhn are philosophical arch enemies, it is becoming more and more clear that they are in fact close allies.[363] Both the authors show that in spite of huge differences between them [Carnap and Kuhn], their similarities are striking. They also write, 'The basis for the latter is a pragmatically oriented semantic conventionalist picture of science, which suggests that the view that post-positivists philosophy of science constitutes a radical revolution which has no interesting affinities with logical positivism must be mistaken.'[364]Reisch proves that Carnap was very much ready to accept the proposal of Kuhn about historical development of scientific thoughts. For better understanding he discloses two unpublished letters of Carnap to Kuhn.[365]

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[363]GurolIrzik and TeoGrunberg, Carnap and Kuhn: Arch Enemies or Close Allies?, in British J. Phil. Sci. 46(1995), 285-307.

[364]ibid, p.285.

[365] Kuhn was advised to contribute a monograph for the serious of *Foundation of the Unity of Science* (Neurath et al. 1955, 1970). During the time, Carnap and Charles Morris were associate editor of *International Encyclopedia of Unified Science.* It is intended to introduce the logical empiricist views of science especially its methodology and epistemological foundation. Kuhn writes *The Structure of Scientific Revolutions* for the *Encyclopedia*. George A. Reisch discloses two unpublished letters of Carnap to Kuhn in which he convinces his readers that Carnap gladly accepts the *Structure*.

Dear Professor Kuhn;
Thank you very much for sending me your manuscripts. I have read them with great interest, and on their basis I am strongly in favor of your writing a monograph for the Encyclopedia, as you lined out in your letter to Morris of February 13th. I hope that you will find it possible to write your first draft this summer.
I believe that the planned monograph will be a valuable contribution to the Encyclopedia. I am myself very much interested in the problems which you intend to deal with, even though my knowledge of history of science is rather fragmentary. Among many other items I liked your emphasis on the new conceptual frameworks which are proposed in revolutions in science, and , on their basis, the posing of new questions, not only answer to old problems.
I am returning your mss.as educational materials and I will send a copy of this letter to Morris. Sincerely yours…. (12 April 1960).

Dear Professor Kuhn,
Simultaneously I am returning your manuscript "The Structure of Scientific Revolution". I am happy that it is now in final form and that U. of Chicago Press has found a way of publishing it in its full length. I am especially gratified by the fact that we can incorporate this work into the Encyclopedia.
I am convinced that yours ideas will be very stimulating for all those who are interested in the nature of scientific theories and especially the causes and forms of their changes. I found very illuminating the parallel you draw with Darwinian evolution: just as Darwin gave up the earlier idea that the evolution was directed towards a predetermined goal, men as the perfect organism, and saw it as a process of improvement by natural selection, you emphasize that the development of theories is not directed toward the perfect true theory, but is process of improvement of instrument. In my own work on inductive logic in recent years I have come to a similar idea: that my work and that of a few

Lastly, Reisch questioned about the above letter very plainly that if Carnap thinks this book to be death-penalty for them this issue would not have been so complementary. It proves that Carnap did not think it to be a formidable challenge to them. Reisach in this paper remarked that Kuhn's normal science corresponds to activity within scientific language and that scientific revolution as a Kuhnian paradigm shift is similar to the transition from one Carnapian scientific language to another.'[366]Earman has drawn attention both to some striking similarities and important difference between Carnap and Kuhn. The similarities include the thesis of incommensurability in the sense of untranslatability and the rejection of language-independent neutral facts. The difference Earman cites are Kuhn's adherence to a form of semantic holism which cannot be found in any Carnap's writings, the conspicuous absence of degree of confirmation among Kuhn's criteria for theory-choice, and Carnap's view that scientific theories are not chosen for accepted but only rendered probable.'[367] Kuhn himself exasperated the issue by putting some provocation to the on-going debate. He writes, 'But, if I understand Carnap's position correctly, the cognitive importance of language change was for him merely pragmatic. One language might permit statements that could not be translated into another, but anything properly classified as scientific knowledge could be both stated and scrutinized in either language, using the same method and gaining the same result … Language change is cognitively significant for me as it was not for Carnap'[368] Now, let's move to the section of the paper in which the author discusses about Kuhn's challenges to logical empiricism. It needs to remind that *The Structure* becomes the most influential book on philosophy of science in 20th century although it is not written by a philosopher. It is generally argued that this book has disowned the claim of logical empiricists about scientific knowledge that every scientific theory directly or indirectly depends on human senses i.e.

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friends in the step for step solution of problems should not be regarded as leading to "the ideal system"., but rather as a step for step improvement of an instrument. Before I read your manuscript I would not have put it in just those words. But your formulations and clarifications by examples and also your analogy helped me to see clearer what I had in mind.
From September on I shall be for a year at Stanford center. I hope that we shall have an opportunity to get together and talk about problems of common interest.
With best regards yours,…(28 April 1962)

Following this letter Carnap writes Charles Moris on the very day that, Dear Charles, herewith my approval of Kuhn's ms...which is really a fine of work. (28 April 1962).

[366]GurolIrzik and TeoGrunberg ,"Carnap and Khun : Arch Enemies or Close Allies?" in Brit. Phil. Sci. 46(1995), p. 285.
[367] ibid, p.286
[368] T. Kuhn, Afterwards, in P. Horwich (ed.), World Changes, Cambridge M.A MIT Press, pp.311-41.[this quotation is taken from the above article: GurolIrzik and TeoGrunberg , Carnap and Khun : Arch Enemies or Close Allies? Brit. Phil. Sci. 46(1995), p. 285.]

experiment and observation. Michael Friedman in his long essay on "Kuhn and Logical Empiricism" proves that post-positivist philosophy of science stands against logical empiricist basic formulae. He points out some important clues in this regard to prove that Kuhn's holistic approach towards scientific revolution or scientific theories altogether by no means similar to that of empiricists view.

Now, let's think about Raatikainen's observation about Quine's position. Although his nice essay has been explicated to prove him a non-verificationist, however, it becomes clear that there are sufficient arguments to prove him an empiricist. Raatikainen started his essay by giving a quotation from H. Putnam. Putnam writes, '[A]lthough Quine is widely known as an influential critic of logical positivism, there is now a growing tendency to emphasize the similarities between him and the logical positivists of the Vienna Circle.'[369] Cheryl Misak and Roger Gibson also prove that Quine was a verificationist. In his famous article 'Epistemology Naturalized' Quine says, 'Two cardinal tenets of empiricism remained unassailable, however, and so remain to this day. One is that whatever evidence there is for science is sensory evidence. The other … is that all inculcation of meaning must rest ultimately on sensory evidence.'[370]

When Quine is found to expose a remarkable line, 'a sentence or set of sentences is devoid of empirical content unless it is testable' then nothing is left to prove him verificationist.

In the concluding section of my discussion I find an apparent contradiction in the position of logical empiricism. According to the epistemological point of view logical empiricism doesn't accept anything's existence apart of human experience. On the contrary, science always advocates the object truth regardless of human thoughts. So, any attempt to establish philosophy on a firm basis like science thrown the positivists in an unresolving paradox. How the gap is addressed here is not clear to the later critics. Further, the proposition of geometry in non-Eucledian physics loses its merit to be analytic character. To be sure, those so-called postulates are contingent in nature so, logical empiricists can't push it to the analytic frame of reference. However, I also make the opinion that logical empiricism didn't die out forever, creates a long way for the philosophers to open up a horizon of future thoughts. I may conclude this section mentioning an opinion of Michael Friedman: 'The

[369]H. Putnam, 'The Greatest Logical Positivist', in his Realism with a Human Face (Cambridge: Harvard University Press, 1990); J. Van Evra, 'Quine and Logical Positivism', Journal of Philosophical Research 19 (1994).
[370]Quine, 'Epistemology Naturalized', p. 75

logical positivist movement thus was not only identified with Einsteinian physics and modern abstract mathematics, but also with socialism, internationalism, and "red Vienna".[371]

[371] Friedman, preface.

7

CONCLUDING REMARKS

Principal contention of this project is basically rested on two grounds: a) seeking a scientific basement of logical empiricism in terms of epistemological expedience, b) to see the legacy of the movement as a philosophical conundrum with more substantial insights. As an important philosophical doctrine, logical empiricism develops within a science-ridden atmosphere at the turn of twentieth century. Two important physics – theory of relativity and quantum mechanics--came to the fore contemporaneously as revisionary outlook in science which has much to do with scientific non-realism. Here I have attempted to show the linkage between the scientific development of human thoughts and logical empiricism on the one hand; and, on the other hand, as a philosophical issue in what extend it leaves the space for further philosophic amelioration in the contemporary period. In addition, it is also intended to explain the basic problem of philosophy for which logical empiricism is mainly concerned. The later part of my thesis has been put in action to find out its impact on contemporary thoughts. I must go with Friedman's argument here about its influence on later thoughts as: 'It is by no means surprising, therefore, that the logical positivist movement was very actively engaged with other vocal philosophical movements of the time as well – with neo-Kantianism, with Husserlian phenomenology, and even with the "existential-hermeneutical" variant of phenomenology then being initiated by Martin Heidegger.'[372]

Here, it is often misconceived that logical empiricism as a philosophical doctrine smashes morality, ethics, religion and all human good senses because it has nothing to do with the real problem of life. Obviously, relativism, as a follow-up of modern thoughts makes the challenges of classical ideas both in physics and philosophy. So, indeed, logical empiricism mustn't shrug off the criticism in any way which, I believe, strikes a major blow against traditional conviction. For example, the term "good" or "bad" are defined here in terms of approval or disapproval or similar psychological attitudes towards anything. As an obvious consequence, the traditional belief had been overshadowed with the advent of this new philosophy. In the very sense, logical empiricism invokes philosophical relativism which generally stands against human traditional morality in ethics and critical realism in epistemology.

[372]Friedman, *Reconsidering Logical Positivism*, p. xi

Empiricism as a source of knowledge had been attacked by philosopher of all ages. In ancient time, experience, is badly criticized by rationalist as well as metaphysicians; however the importance of experience in knowledge is never denied. To be sure, if anything goes wrong with false perception or wrong experience in any case, further perception is needed to disproof the previous one. Truly, in every case, observation must not be override on the way to knowledge. Therefore, experience, as a method of philosophy, never had been disregarded. So, to remember, empiricism yet doesn't meet all objections against it, however it plays an essential role in epistemology. Truly, logical empiricism as an important legacy of classical empiricism tries to rebuild the philosophy of experience with huge difficulties. Meanwhile, physics comes with these thoughts contemporaneously as an essence of the empirical strand. My principal contention in this thesis is to make the rapport of these two.

Physics, in fact, reached such a point that all achievements are left far behind[373] in the new century. Albert Einstein, the chief architect of this new physics, makes the whole thing possible and turns the old idea out. He is only responsible to turn our views aside from Newtonian classical mechanics. Before Einstein, Newtonian physics was in dominance which was in most part *a priori* in nature. Einstein by astounding ingenious analysis has 'purged the most fundamental conceptions of natural science by removing all the prejudices which have for centuries past remained undetected in them: thus revealing entirely new points of view, and building up a physical theory upon a basis which can be verified by actual observation[374]. Thus, Einstein makes the difference than previously stated physics by the method of experimentally verified ideas. It mustn't be denied that David Hume and Ernst Mach impossibly inspired him especially to form the idea of space and time. Einstein's unrivalled achievement comes into prominence in 1905 after publication of his three essays which breeds three important physics respectively: a) theory that explain photo electric effect, b) theory that explain how to explain motion between different inertial frame of reference, c) Brownian motion. Special theory of relativity smashes the classical idea of moving bodies in terms of length, mass and time. It unhesitatingly declares that Newtonian physics was limited and can't explain the physical world correctly. Newton was previously quoted as, 'Absolute and true mathematical time flows in virtue of its own nature uniformly and without reference to any external object' and ' absolute space, by virtue of its own nature and without reference to any external object, always remain the same and is immovable.' But with the approach of the principle of relativity Newtonian physics becomes inoperative

[373]MortitzSchlick, *Space Time in Contemporary Physics,* p. 1
[374]*ibid,* p.1

especially for the case of moving bodies when it is thought to be travel fast near to the light. Further, Newton doesn't add the factor of time up to his theory of Gravitation. So, the factor of time was utterly unclear in his physics. For example, the distance between the earth and the sun is 149597870 k/m; suppose, for any reason, if the sun is collided by some objects and displaced from its own orbit – Newtonian physics predicts that man living in earth can be able to understand the deflection at once however, the new physics doesn't concede the prediction. It says, after reaching out the light to man the 'tension' will be cognizable to man which takes sufficient time (eight minutes). So, the case of light is always added in terms of comprehending the distance between two stellar objects.

Einstein, at the same time, tries to recapitulate Newtonian theory of Gravitation ($F = G. m_1. m_2 / d^2$)[375] and its exact explanation to interpret the nature. That is why he was out to reconcile the explanation by the help of the new idea of space and time. And, he was introduced to a new geometry by the help of his German friend M. Gauss. Euclidian geometry which is called traditional geometry or Flat geometry proclaims some axioms[376] were challenged by Gauss. Certainly, Euclidian geometry makes no effective judgment for the case of curved surface. In the curved surface, two apparent lines may intersect with each other at any time or the sum of angles of the triangle on a curved surface will never be one hundred and eighty degrees. With the help of Gaussian geometry, Einstein successfully finds the secrecy of Gravitational force. To have a better understanding Einstein revised his previous theory and introduced general theory of relativity in 1915. He says gravitational tension is not merely an attraction of two objects, as Newton says, in void but it should be seen as 'apparent force'. And, it arrives at a new phenomenon due to the curvature of the space by itself. Thus, according to Einstein, gravitational force between two objects occurs not for 'tension' but for the curvature of space. Everything in the world however small may be is likely to be affected by the curvature of space. Truly, Einstein's new prediction[377] was proven by experiment in 1919.

A new physics – quantum mechanics—was developed at the same time despite the fact that Einstein doesn't agree with some of its findings. Although the philosophy of quantum

[375]LOG states that any two objects exert a gravitational force of attraction on each other. The direction of the force is along the line joining the objects. The magnitude of the force is proportional to the product of the gravitational masses of the objects, and inversely proportional to the square of the distance between them.

[376]For example, the sum of the three angles of triangle is 180^0 or two parallel lines never intersect with each other etc.

[377]Einstein, in GTR, predicts that the ray running through the sun from other stellar object may have a deflection due to the curvature of space. Sir Arthur Eddington leads a group of scientists to prove Einstein's prediction in 1919 and finds the exact deflection measured by 1.74 sec.arc.

mechanics is unhesitatingly supported by philosophical non-realism and likely to escort by relativity theory, however, the fundamental difference between these two are not redressed. The philosophy of the principle of indeterminacy – on which the quantum mechanics rests on—brings human mind in the realm of utter uncertainty. It provokes our mind to revamp the principle of determinacy which was supposed to be the core of Newtonian science. It also makes a huge blow to the theory of causation, which proclaims that everything must have a cause or nothing happens by chance. Neils Bohr, father of the atomic theory and a leading quantum mechanist had a long relation with Vienna circle. He is said to be a logical positivist[378] because his physics takes hold the very essence of empiricism. The effectiveness of a physical theorem depends on the precision of prophecy about the nature i.e. how correctly or aptly the theory can comprehend the events. As a matter of fact, 'Quantum physics inexorably teaches that it is in principle impossible for future events to be exactly calculated beforehand in every detail'[379]. Furthermore, it seems to be a paradox that the principle of uncertainty restricts human mind to predict the exact location of particle. It also seems to be indicated the limitations of human mind to understand the riddle of nature. But, this apparent indetermination to comprehend the momentum doesn't and mustn't stand against the spirit of Vienna School. According to logical empiricism nothing in the world is intrinsically incomprehensible. So, the philosophy of indeterminism might have been looked as anti-positivism. It is, here, to remember that limitation of human knowledge is a common event. More importantly, it proclaims that to understand the nature or its inherent secrecy man can't depend on the presuppositions. Whether the nature of an electron can be comprehensible it also depends on the experiment for which it is set for. Without having any relation with the sense of experience it can't be possible to grasp the characteristic of electron in the atom. I believe that these two physics along with some developments in

[378]Jan Faye, in "Niels Bohr and the Vienna Circle" writes,'For although much of what the Vienna Circle stood for must have been attractive to Bohr, there were also issues that distinguished him from the movement. Their conclusions were similar but they arrived at them from different premisses. The positivist's analysis was based on a logical-conceptual approach whereas Bohr took his departure in the empirical discovery of the quantum of action and what he considered to be the principal use of classical concepts. But naturally enough the metaphysical animosity of the positivists influenced him when he was in the amidst of his most important debate with Einstein, and their strong emphasis on an empiricist criterion of significance supported his view about the experimental conditions under which classical concept in quantum mechanics could correctly be used. For him the important thing was that there exists no physical reality behind what can be grasped in terms of ordinary language and its precise scientific amendments, which is also the language of physical things to which the positivists had turn in the beginning of the thirties. So it seems right to conclude that Bohr received some philosophical inspiration and moral support by his discussion with the members of logical positivism.' Copenhagen University, Denmark.

[379]MortizSchlick, "Quantum Theory and the Knowability of Nature." in *Philosophical Papers,* p. 482.

biology as well were very much common with the philosophy of positivism. It is not difficult to understand the common agenda where the philosophy of positivism and the new physics intersect with each other.

Now, I need to address another problem concerning the scientific background of logical empiricism. This is about the science of language. I strongly believe that the term 'scientific' includes many other issues in which linguistic clearance is essentially mooted out. When does a language appear to be meaningful? When a language is pondered to be scientific? These questions are seriously discussed in linguistic philosophy. I have taken this issue in my thesis as an important background of logical empiricism. I concede the main line up with the empiricist to ascertain the logical foundation of language and its status how of to be meaningful. Philosophers are divided with the question of function about philosophy. Philosophers are disagreed with the role and activity of philosophy in history. Some people, in history, don't seek any function of philosophy other than exploring the first principle of the universe. In turn, logical empiricists want to label it an activity. They take hold the view that philosophy should only be in function with the analysis of language and to clarify the meaning it express. Ayer says, 'philosophy is in some special sense, an inquiry into language.'[380] This question is addressed here with a view to seeking a logical (scientific) background of language. Of course, the chief function of language is to communicate with others securely. And, to make it secure meaningful language has a responsibility to follow the grammatical rules first and then the logical rules it tries to imply. For example, 'sky is blue', 'Monday goes to everyday,' 'unicorn has two horns' are different set of sentences which have a definite meaning or no meaning at all. For grammatical precision, sentences should have to follow the rule of language but in philosophy this is not enough. The responsibility of the language is not merely confined within the realm of grammatical sphere, but more than that, i.e., its chief function is to clarify the idea for which it is ascribed. I am not sure to what extent metaphysical languages do have the ability to face the challenges. Metaphysical language is extremely private and its function is only to provoke the human emotion. Therefore, the emotive value of these languages should never be reproached. But, that should be another issue because in philosophy emotion has nothing to do with the problem of epistemology.

In the first place, the effort to demonstrate the impossibility of metaphysics was very naïve and simple, so it had to face difficulties in and outside of the school. With the face of it Ayer

[380]Ayer, " Philosophy and Language" in *The Concept of a Person,* p.3

particularly goes to modify the earlier version of the principle[381], however, it fails to signify the real meaning. The central point of the new version is focused on directly or indirectly verifiable. Alonzo Church in the review of the second edition of LTL finds the loophole of Ayer's argument[382]. Later on, Ayer in an interview with Bryan Magee concedes his previous mistake and temporarily rejects his attempt to reject metaphysics. Here, to the logical empiricists, the word "meaning" is likely to be restricted to the term of "method of verification". Finally, in the strict sense, this hypothesis makes very little sense to the ordinary people. Accordingly, as the issue of "meaning" and 'verification" is synonymously taken by the empiricists so it invokes many questions one after another. Maritz Schlick unconditionally put the judgment as: 'the meaning of a proposition is the method of its verification.' I believe that this simple position makes the whole proposal difficult in such way that "verification of sentence" is not an easy task to define. That is why the principle of verification suffers a set of difficulties in spite of its repeated modifications. I confess here that logical empiricists didn't successfully come across the criticism brought against it. Most importantly, the very weapon to override metaphysics was not sharp enough.

Every language, I think, in the world has certain rules (rule of syntax and rule of semantics). Many logical empiricists argue that proposition – smaller unit of language—express the reality and always thought to be true or false. But, metaphysical language has no merit to be true or false and essentially called it meaningless because it expresses nothing but sophistry and illusion.

This very position is seriously challenged by later philosophers. On this issue, I am in fact neither taking the position of empiricist nor metaphysician. My position here is defined the principle of verification is really vulnerable and it is too strict to stand fast; so, it mustn't be the case that metaphysics is to decapitate by using the principle. On the other hand I strongly hold that metaphysics really prevents human mind to explore the secrecy of nature in terms of epistemological ground. Metaphysics is important and entirely worthy pursuit as an axiological (which deals with value) part of philosophy not epistemological, because it arises

[381]In the second edition (1946) of LTL Ayer proposes direct and indirect verifiability principle as follows: a statement is directly verifiable if it is either itself an observation-statement, or is such that in conjunction with one or more observation statements it entails at least one observation-statement which is not deducible from these other premises alone; and I propose to say that a statement is indirectly verifiable if it satisfies the following conditions: first, that in conjunction with certain other premises it entails one or more directly verifiable statements which are not deducible from these other premises alone; and secondly, that these other premises do not include any statement that is not either analytic, or directly verifiable or capable of being independly established as indirectly verifiable.'p. 13.

[382]

out of human passion, emotion etc. However, the function of epistemology is critical and knowledge seeking enterprise. At the same time, the function of metaphysics can never be denied here. I agree with Carnap that metaphysics starts its journey amid human passion and mystic feelings. Metaphysics is solely responsible to provoke human mind and also to take the action of human feelings to understand the so-called world of "thing-in-itself", which I think it should be another issue. In my thesis science of language as a scientific background of logical empiricism science of language is much more important.

Now, let's turn to the later part of my thesis. Contemporary effects of Logical empiricism are really significant. I believe that some senses were grown among the philosophers as a post-positivistic reaction which is equally important from epistemological point of view. Karl Poppers theory of falsification, P. Fereraband's epistemological anarchism, T. S. Kuhn's naturalism, Quine's epistemological naturalism, Duhem-Quine's joint thesis on verification, Von Frassen's anti-realism, pragmatism and phenomenalism are essential development of logical empiricism.

Palpably, logical empiricism starts a long journey in philosophy of science which leaves two vestiges: i) gradually philosophy plod march towards subjectivism, ii) classical or traditional morality had been on the way to shake. Objective foundation of science was in serious threat after the casual theory was about to ruin. This gradual deflection form the very nature of science creates a vacuum all along. Meanwhile, new approach to science significantly takes hold the ground. Relativism, therefore paves the way for human new thoughts. At the same time, sociology, history, and the traditional morality along with science were in a heavy blow. So, the effect of logical empiricism on contemporary philosophy is not a small event.

I am not finally convinced with the position of logical empiricism completely because of the acrimonious and unabashed stand of the empiricists. Moreover, the very criterion by which it is demonstrated to prove the impossibility of metaphysics is not altogether convincing. In spite of substantial influence of modern physics logical empiricism finally fails to take hold the position correctly. I am in a pursuit of those difficulties that becomes a bone of contention among the philosophers. At the same time, for metaphysics, I strongly go with the argument of logical positivists that it has an immense influence on human quasi-poetic expression to life.

Before going to conclude I will share some important notes of Allan W. Richardson about the reappraisal of logical empiricism and its role in analytical philosophy. Richardson[383] writes,

> There are, no doubt, many reasons, but a few stand out as the important ones. First, perhaps more than any other aspect of analytical philosophy, logical empiricism did dominate its fields of endeavor—principally philosophy of science—for a very long period. Logical empiricism provided the working framework of most philosophers of science from roughly the 1930s to 1960s. Moreover, the issues place at the heart of philosophy of science by the logical empiricists—the analysis or explication of important scientific and meta-scientific terms (confirmation, explanation, and so on)—continue to play a major role in philosophy of science, even as criteria of analytic adequacy change. It would not be too great an exaggeration to claim that philosophy of science as a discipline distinct from epistemology would not exist without the impetus of logical empiricism.[384].

Lastly, I will make a note here about my entire project. Logical empiricism as a theory of knowledge is developed within an atmosphere of empirical tradition of 20th century and becomes contemporaneous to the development of Relativity and Quantum era. In true sense, Einstein was a not a logical empiricist but his philosophy of relativity aptly stands in favour of empiricism. His idea of space and time or space-time continuum must disown *a priori* from of physical theory. Instead, the relativity of space and time officially acknowledges *a posteriori* mode of space-time description. No observer, according to this theory, can put a description of an event without his involvement in the entire process i.e. his subjective involvement into the measurement. That is why, the very idea entirely lean upon observatory coincidence of events. Very clearly, the philosophy of relativity thus makes his affinity to the philosophy of Hume especially his criticism of the ideas of substance and causality. On the other hand, Niels Bohr, undeniably a positivist, was the chief architect of Quantum mechanics became famous for his anti-realism. Quantum

[383]Professor at the University of British Columbia, Canada and co-editor of Origin of Logical Empiricism(Minnesota Studies in the Philosophy of Science, XVI, University of Minnesota Press, 1996, V.16, Minnepolis, London).p.1

[384]Alan explains, the dominance of logical empiricism was greatly facilitated by the early volumes of Minnesota Studies in philosophy of science. Thus, it has been a matter of considerable poignancy for contributors to the volume that it appears in the same series.

mechanics first shows that operation of observation affects the whole physical systems. Anti-realism of Quantum philosophy very strongly supports logical empiricism.

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