

# Karl Popper and the Metaphysical Debate: Historical Context and Critical Innovations

JOHN E. FUNELAS, O.P.<sup>1</sup>

This article contains an exposition of two main points: first, the context into which Popper joins the metaphysical debate; and second, his concept of metaphysics in the light of his own demarcation criterion and metaphysical research programs.

## Historical Survey of Metaphysics

The history of metaphysics is effectively with the history of philosophy.<sup>2</sup> Thales and the Milesian thinkers are both cosmologists and metaphysicians. They pioneered in the West the inquiry as to the ultimate constitution of the world. Metaphysical questions arose because of the reality of the cosmos.<sup>3</sup> Popper is cognizant of the importance of cosmology: "there is at least one philosophical problem in which all thinking men are interested," and that is the "problem of cosmology." All "science is cosmology."<sup>4</sup> Likewise, cosmology and the theory of knowl-

---

<sup>1</sup> Fr Funelas, a Doctor of Philosophy from the University of Santo Tomas, Manila, is a Professor at the same University as well as at the Philippine Dominican Center of Institutional Studies, Quezon City.

<sup>2</sup> Takatura Ando, *Metaphysics. A Critical Survey of its Meaning* (Hague: Martinus Nijhoff, 1963), p.1. [Henceforth, *Ando*].

<sup>3</sup> See "Introduction," J.B. Wilbur and H.J. Allen, eds., *The Worlds of the Early Greek Philosophers* (New York: Prometheus Books, 1979); Cf. Montgomery Furth, "Elements of Eleatic Ontology" in *The Pre-Socratics. A Collection of Critical Essays edited by Alexander Mourelato* (New Jersey: Princeton University Press, 1993).

<sup>4</sup> *The Logic of Scientific Discovery* (1959), Julius Free & Lan Freed (trans.) [Henceforth *LScD*], 15. Cf. *A World of Propensities* (1990) [Henceforth *AWP*], 7.

edge are inter-related.<sup>5</sup> The problem of knowledge is effectively a problem of cosmology.<sup>6</sup>

Anaximander gave a somewhat abstract answer to the basic question of ultimate reality with his "*apeiron*" or indeterminateness. However, the "appearance" of metaphysics could be rightly attributed to Parmenides. Julian Marías opines: "...[Parmenides] represents a moment of major importance – the appearance of metaphysics. With Parmenides, philosophy acquires its true hierarchy and constitutes itself as a strict discipline. [...] philosophy comes to be metaphysics and ontology."<sup>7</sup>

If we are to accept Alfred North Whitehead's notion that the history of western philosophy is but a footnote to Plato, then Platonic metaphysics is its apex. Plato transformed Parmenides' 'being' into the immutable non-perceptible forms (*eide*) or ideas (*ideai*). Perceptible changing things are mere copies or shadows of the Forms. What is real is the pure, perfect Idea.<sup>8</sup> Platonic metaphysics is inseparable from his epistemology as attested by Nicholas White. "His [Plato's] metaphysics arise largely from his attempt to describe how the world must be if we are to be able to have any knowledge (*episteme*). Plato assumes... that we do have knowledge, as distinct from mere 'opinion' or 'belief' (*doxa*). He then tries to show that if this is so, then there must necessarily exist non-perceptible Forms which this knowledge is about (*Phdo* 74, *Rep.*475-80, *Tim.*51)."<sup>9</sup>

---

<sup>5</sup> Conjectures and Refutations: The Growth of Scientific Knowledge (1963) [Henceforth CR], 136 ff.

<sup>6</sup> AWP, 39.

<sup>7</sup> Julian Marías, *History of Philosophy* (New York: Dover 1967), p.20. Cf. Karl Popper, *The World of Parmenides* (1998), edited by Arne Petersen [Henceforth TWOP], 114. Popper disagrees that there is such a thing as ontology and its attribution to Parmenides. He avoids using the term. See also *The Open Universe: An Argument for Indeterminism. From the Postscript to the Logic of Scientific Discovery*, edited by W.W. Bartley III (1982) [Henceforth P2], 7, fn3; *The Self and Its Brain: An Argument for Interactionism*, with John C. Eccles (1977) [Henceforth SB], 4.

<sup>8</sup> See Plato's *Republic*, Books VI-VII (analogy of the cave).

<sup>9</sup> Nicholas White in J. Kim & E. Sosa, eds. *A Companion to Metaphysics*, (Oxford: Blackwell Pub., 1995), p. 394.

The term 'metaphysics' came much later. Traditionally, it is believed to have been coined from the Greek *ta meta ta physica*, by Andronicus of Rhodes, a Peripatetic in the first century B.C. It was a term meant for classifying the work of Aristotle (384-322) that deals with subjects beyond empirical observation.<sup>10</sup> It is characterized as the one science that studies all things *qua* being.<sup>11</sup>

But Takatura Ando has an interesting version. According to him, Hans Reimer considers this a misinterpretation. Let us quote him: "Eudemus, Aristotle's immediate disciple, the author of the *History of Theology*, and the first editor of his teacher's works, is supposed by Reimer to have invented the name *ta meta ta physica*. [...] Andronicus followed Eudemus and preferred the name *metaphysika* because he considered the original name of 'first philosophy' to be unsuitable to educational order."<sup>12</sup> Be it Andronicus or Eudemus, the important fact is that the genesis of the term has something to do with the works of Aristotle.

Aristotle has called metaphysics by at least three different names: "*sophia, prote philosophia, and theologike*."<sup>13</sup> Wisdom deals with the first causes and principles of things.<sup>14</sup> Aristotle affirms that metaphysics is the science of first causes and first principles<sup>15</sup> and distinguishes metaphysics from the study of nature by saying that "physics is also wisdom, but not the first." Physics is wisdom because it studies motion and the four causes of things [efficient, formal, material, and final]; it

---

<sup>10</sup> See the 'Introduction' of Richard Mckeon, ed. *The Basic Works of Aristotle* (New York: Random House, 1941), p. xviii. "Metaphysics" was the title given by one of the first of Aristotle's editors, Andronicus of Rhodes, to the work placed by him 'after the Physics' (and that is doubtless the meaning he attached to the name); in it was developed the doctrine which Aristotle sometimes refers to as 'Wisdom', sometimes as 'First Philosophy', sometimes as 'Theology'. [Henceforth, *Mckeon*].

<sup>11</sup> See *Mckeon*, xviii. Cf. *Metaphysics*, Book IV, 2, 1003b, 15-16. I am using the trans. of W.D. Ross, *Aristotle's Metaphysics* (Oxford: Clarendon Press, 1924).

<sup>12</sup> *Ando*, 5.

<sup>13</sup> *Ibid.*, 8.

<sup>14</sup> *Metaphysics*, Book 1 Chapter 1.

<sup>15</sup> *Ibid.*, Bk.1, Chap.2. He says that "the most universal, are on the whole the hardest for men to know; for they are farthest from the senses. And the most exact of the sciences are those which deal most with first principles; for those which involve fewer principles are more exact than those which involve additional principles."

is not first philosophy because it does not study being *qua* being, being in its matter-form composition.

What does Aristotle mean when he says that metaphysics is the science of being as being – “being *qua* being”? It is being as substance.<sup>16</sup> The study of being is then primarily the study of substance.<sup>17</sup> If what Aristotle means by “being *qua* being” is “being as substance (*ousia*)” then one may ask whether metaphysics is really distinct from the philosophy of nature.<sup>18</sup> In the matter-form principle, the form is the highest. The form of a given being is “an act of which there is no other act.” But the question is “how do we account for immaterial substances?” How do we explain the uncreated Being?

Thomas Aquinas (1255-1274) fills this gap. Unlike Aristotle, he says that “to be” does not mean “to be a body”. There is a distinction between “what a thing is” and “that it is (*Quid sit? An sit?*); between essence and existence.<sup>19</sup> It is possible to have an essence, say a cat with fifty legs, though it may not exist. It is only God whose essence is existence. There are real beings which may not be material. Aquinas’s metaphysics is a “metaphysics of ESSE”. Being *qua* being is understood as being *qua* ESSE.<sup>20</sup>

He posits the theory of “act and potency” along the lines of Aristotle’s hylemorphic theory.<sup>21</sup> “Act” is superior to “form.”

<sup>16</sup> *Ibid.*, Bk.1, Chap.1.

<sup>17</sup> *Ibid.*, Book VII, Chap.1 (1028b).

<sup>18</sup> Pedro Gabriel, “Is there a Philosophy of Nature” in Norberto Castillo, ed., *Nature, Science and Values* (Manila: Sto. Tomas University Press, 1988) p. 99. This author draws from the works of Etienne Gilson.

<sup>19</sup> Cf. Aquinas, *Exposition of Boethius on the Trinity*.

<sup>20</sup> John Knasas, “Four Lectures on Aquinas’ Metaphysics of Actus Essendi and our Knowledge of God.” Center for Thomistic Studies, University of St. Thomas, Houston, Texas. [Unpublished paper].

<sup>21</sup> Cf. Aquinas, *Summa Against the Gentiles II*, 54. Trans. by V.J. Bourke, in *Pocket Aquinas* (New York: Pocket Books, 1960), p.169. “It is clear, then, that the composition of act and potency has greater extension than the composition of form and matter. Consequently, matter and form are divisions of material substance, while potency and act are divisions of common being. For this reason, whatever concomitants potency and act have, as such, are common to both material and immaterial created substances; for instance, to receive and to be received, to perfect and to be perfected. However,

It could be said that Aquinas' metaphysics is "genuine" metaphysics because it is clearly distinguished from the philosophy of nature. Aquinas affirms that natural philosophy precedes metaphysics though the nature of the former is known by means of the latter.<sup>22</sup> This way St. Thomas divides philosophy into natural philosophy, mathematics and metaphysics corresponding to the first, second and third levels of abstraction respectively.

The greatness of Aquinas' metaphysics does not lie in the fact that it dominated the philosophy of the medieval world, but that later metaphysics became either reactions against it or modifications and affirmations of it. Even in the study of contemporary philosophy, one cannot ignore Thomism.

Descartes (1596-1650), the father of modern philosophy, was schooled in the Scholastic tradition. His philosophy is an attempt to mount metaphysics in the rigorousness of science. He wanted to reconcile metaphysics and science. How could metaphysics be a science and how could science be metaphysical? In his *Discourse on Method* and *Meditation on First Philosophy*,<sup>23</sup> he formulated the clear and distinct beginning of philosophy: *cogito ergo sum*. This is a revolt against Aquinas in a sense that according to Descartes ontology is based on epistemology; existence is founded on the clear and distinct idea.

Although Kant (1724-1804) was convinced that man by nature is metaphysical,<sup>24</sup> he denied man's capacity to know the things-in-them-

---

whatever characteristics are proper to matter and form as such, as, for instance, to be generated and corrupted, and the like, these are peculiar to material substances and in no way appropriate to immaterial created substances."

<sup>22</sup> Cf. Aquinas, *Trinity V, I, reply to Obj. 9*.

<sup>23</sup> Rene Descartes, *The Philosophical Works of Descartes*, ed. E. Haldane & G.R.T. Ross (New York: Dover, 1934).

<sup>24</sup> Immanuel Kant, *Critique of Pure Reason*, trans. by J.M.D. Meiklejohn (New York: Prometheus, 1990), p. 13. "...in other words, metaphysics must be considered as really existing, if not as a science, nevertheless as a natural disposition of the human mind (*metaphysica naturalis*). For human reason, without any instigations imputable to the mere vanity of great knowledge, unceasingly progresses, urged on by its own feeling of need, towards such questions as cannot be answered by any empirical application of reason, or principles derived therefrom; and so there has ever really existed in every man some system of metaphysics. It will always exist, so soon as reason awakes to the exercise of its power of speculation."

selves (*noumena*). His system is called 'metaphysical agnosticism'. It is possible for the mind to know that there are things-in-themselves, but it cannot penetrate into the knowledge of what they are. The best attainable knowledge is that which comes from *synthetic a priori* propositions. "Thus metaphysics, according to the proper aim of the science, consists merely of synthetical propositions a priori."<sup>25</sup>

Hegel (1770-1831) however asserted what Kant denied. Essences can be known. What is real is rational. His system is said to be the apex of metaphysical idealism. The attack against metaphysics has always been present as well. But seemingly it reaches its height in contemporary philosophy with the Logical Positivists. There is an ongoing debate between the "foes and friends" of metaphysics. Seemingly, Popper belongs to the metaphysically friendly side.

### The Attack on Metaphysics

The modern anti-metaphysical movement may be traced back to Francis Bacon (1561-1626). He championed induction and observation as the only valid means of knowing. His *Novum Organon* aims at reinterpreting Aristotle as applied to the new science. Being is what is empirically observable. Hume (1711-1776) and Berkeley (1685-1753) made this the center of their philosophy. Being is what is perceived. Mill and Russell may be counted among these empiricist philosophers. They popularized "the theory that all knowledge is derived from sense experience."<sup>26</sup> The term "derived" may be understood as "inductively derived," or "originates." Auguste Comte (1798-1857), who coined the term *positivism*, dismisses metaphysics as a science. But it is the Logical Positivists who passionately tried "to silence" metaphysics.

Ludwig Wittgenstein (1889-1951) is considered the best representative of Logical Positivism. His famous anti-metaphysical statement is found in the *Tractatus* (6.53). "The correct method in philosophy would really be the following: to say nothing except what can be said, i.e. propositions of natural science – i.e. something that has nothing to do with philosophy – and then, whenever someone else wanted

---

<sup>25</sup> *Ibid.*, 12.

<sup>26</sup> *Realism and the Aim of Science. From the Postscript to the Logic of Scientific Discovery*, edited by W.W. Bartley III (1983), 81. [Henceforth P1].

to say something metaphysical, to demonstrate to him that he had failed to give a meaning to certain signs in his propositions."<sup>27</sup>

Logical positivists are also called members of the 'Vienna Circle'. For them, metaphysics is empirically non-testable, non-verifiable, a meaningless nonsense. They blame metaphysics for the "philosophical puzzles" in the study of philosophy, in as much as traditionally, philosophy is based on metaphysics. Wittgenstein propounds that there are really no philosophical problems but only philosophical puzzles, that is, ambiguities in language. Thus, philosophy should be directed to the analysis of language, distinguishing scientific from pseudo-scientific statements. The Circle proposed *verifiability* as the criterion of demarcation between science and metaphysics. This means that a statement or theory is to be considered scientific if and only if it could be subjected to empirical experiments or sensibly observable.

Popper heard of the Vienna Circle as early as 1926 or 1927. He had read Wittgenstein before he wrote his dissertation. He was also familiar with Carnap's works.<sup>28</sup> The first member of the Circle whom Popper met was Victor Kraft. But it was Herbert Feigl who encouraged him to write a book. At that time, he considered himself as an unorthodox Kantian, and as a realist.<sup>29</sup> From the very start of his career, Popper emphasized that he was opposed to the idea that metaphysics is meaningless. "I do not believe that metaphysics is nonsense, and I do not think it is possible to eliminate *all* 'metaphysical elements' from science: they are too closely interwoven with the rest."<sup>30</sup>

It is clear that Popper was already treating the question of demarcation between science and metaphysics long before he came into

---

<sup>27</sup> Ludwig Wittgenstein. *Tractatus Logico-Philosophicus*. Trans. D.F. Pears & B.F. McGuinness with Introduction by B. Russell (London: Routledge and Kegan Paul, 1961/1974), pp.73-74. See 3.221; 5.633. "What we cannot speak about we must pass over in silence." (7)

<sup>28</sup> *Unended Quest: An Intellectual Biography* (1976) [Henceforth *UQ*], 80.

<sup>29</sup> *Ibid.*, 82.

<sup>30</sup> P1, 179. Cf. 'Replies to my Critics' in *The Philosophy of Karl Popper*, The Library of Living Philosophers, edited by P.A. Schilpp, vol. II (1974) [Henceforth *RC*], 970; *Knowledge and the Body-Mind Problem: In Defence of Interaction*, edited by M.A. Notturmo (1994) [Henceforth *KBMP*], 76. See the topic: "The Demarcation between Metaphysics and Science."

contact with the members of the Vienna Circle.<sup>31</sup> However, it may not also be wrong to say that Popper's philosophy is a reaction against them. He was initially identified with the group; and his first two books deal with problems similar to theirs.<sup>32</sup> Popper argues that their criterion of verifiability<sup>33</sup> is not itself verifiable; that it is itself a metaphysical statement; and that with verifiability, it is not only metaphysics which they annihilate but natural science as well. The method of induction, on which verifiability is based, has a metaphysical character.<sup>34</sup> In a polemical encounter with Wittgenstein, he strongly asserts the existence of philosophical problems.<sup>35</sup>

Popper propounds that, although metaphysics is empirically non-testable, it is important, interesting and meaningful. Most testable scientific ideas are preceded by metaphysics. For example, modern scientific atomism was preceded by the "metaphysical" atomism of Leucippus and Democritus. Instead of verifiability as the criterion of demarcation between science and metaphysics, Popper opts for "falsifiability" as a better criterion. (This will be discussed below.) With falsifiability, Popper claims to have solved the problem of induction and demarcation, and consequently to have "killed" not metaphysics but logical positivism. "Everybody knows nowadays that logical positivism is dead. [...] I fear that I must admit responsibility."<sup>36</sup> Despite this attack, he admires their rational attitude. "It is in this general attitude, the attitude of the enlightenment, and in this critical view of philosophy ... that I still feel very much at one with the Vienna Circle and with its spiritual father, Bertrand Russell."<sup>37</sup>

---

<sup>31</sup> *UQ*, 82.

<sup>32</sup> What distinguishes science from metaphysics? Is there metaphysics? What are truly philosophical problems? Is induction the method of verification?

<sup>33</sup> Verifiability and verification are synonymously used.

<sup>34</sup> *LScD*, 254. "...for the principle of induction is itself metaphysical in character."

<sup>35</sup> See *RC*, 970 (his letter to the Editors of *Erkenntnis* and *Logik*). Cf. *LScD*, 313. "However, it is not only metaphysics which is annihilated by these methods, but natural science as well." Cf. *KBMP*, 76, 77; *LScD*, 19, 32, 35-39, 252-253. Also "Remarks on the problems of demarcation and of rationality" in *Problems in the Philosophy of Science*, ed. by I. Lakatos and A. Musgrave (1968), pp.88-102. [Henceforth *RPDR*], 84-85.

<sup>36</sup> *UQ*, 88.

<sup>37</sup> *Ibid.*, 89.

The diagram below by Victor Kraft effectively illustrates the attitude of the logical positivists vis-a-vis Popper regarding metaphysics.<sup>38</sup>

| ISSUE                             | LOGICAL POSITIVISTS                 | POPPER                                                                              |
|-----------------------------------|-------------------------------------|-------------------------------------------------------------------------------------|
| What can we do about metaphysics? | It is just nonsense.<br>Destroy it. | We are all metaphysicians;<br>and science derives historically<br>from metaphysics. |

If metaphysics is "just nonsense" then science may as well be held to be a "mute discipline," for Popper believes that there would be no science without metaphysics. Even the "technological and instrumental attitude towards science", which they promote, presupposes metaphysics. Accordingly, this attitude is the cause for the "decline of science."<sup>39</sup> Popper replaces it with a philosophy of science friendly to metaphysics.

### Popper's "Metaphysical Turn"

Great philosophers tend to "shift" or "develop" their ideas, even to the point of totally repudiating their earlier positions. In the case of Popper, he is explicit in his change of views regarding probability<sup>40</sup> and quantum theory.<sup>41</sup> But with regards to metaphysics, his position is not that clear. It should then be resolved whether he claims to have written a metaphysical treatise, and whether there is a "problem-shift" in him towards metaphysics.

Popper started philosophizing at the young age of seventeen.<sup>42</sup> He began with the problems of method (demarcation and induction).<sup>43</sup>

---

<sup>38</sup> Victor Kraft in Paul Schilpp ed. *The Philosophy of Karl Popper*, vol.2 (Illinois: Open Court, 1974), p. 1067.

<sup>39</sup> *Quantum Theory and the Schism in Physics. From the Postscript to the Logic of Scientific Discovery*, edited by W.W. Bartley III (1982) [Henceforth P3], 157.

<sup>40</sup> See P1, 282. From frequency probability to propensity theory.

<sup>41</sup> See P3, 97.

<sup>42</sup> CR, 33. He published philosophical articles before he completed his dissertation. Cf. Albert Bagood, *The Role of Belief in Scientific Discovery: Michael Polanyi and Karl Popper* (Rome: Millenium Romae, 1998), pp. 16-17 [Henceforth Bagood].

<sup>43</sup> The concern with the problem of method may not be unique to Popper. Philosophers writing in the early twentieth century were confronted with the problem of the

Philosophy is in fact his first and last love.<sup>44</sup> His chief interest has always been the problem of knowledge. As to metaphysics, he displays conflicting signals.

The first issue to be resolved is with regards to his "metaphysical works." On the one hand, Popper explicitly mentions metaphysics in the following works: *Conjectures and Refutations* (Sections 8 and 11); *Unended Quest* (Sections 33 and 37); *Postscript* (Chapter 3 of *P1*, Chapter 4 of *P2*, and Chapter 4 of *P3*); *The Myth of the Framework* (Chapter 5). In *The Logic of Scientific Discovery*, he barely mentions it, although he says in the *Preface*, "metaphysical ideas have shown the way."<sup>45</sup> He confirms that in that book he already believed in "metaphysical realism."<sup>46</sup>

On the other hand, he never admits having written a metaphysical work.<sup>47</sup> Corvi opines that Popper has not really written any metaphysical works, but only "metaphysical doctrines recurring within works that are also – perhaps mainly – devoted to gnoseological arguments."<sup>48</sup> This same author adds: "His [Popper] chief interest is always the same: he remains with gnoseology and steers clear of 'what is sometimes called an "ontology"' (SB: 4). And whether referring to the *Postscript* or a fortiori to the *Logic of Scientific Discovery*, he stresses that he has not written books of metaphysics." However, Corvi is quick to clarify that this "would be true if metaphysics is understood as classical ontology rather than as what Popper meant by the term."<sup>49</sup> Popper's 'metaphysical works' are not ontological, but "sui generis."

---

methods of the natural sciences and the human sciences [*Naturwissenschaften and Geisteswissenschaften*]. Because of the success of the natural sciences, they asked: Is the method of the natural science applicable to the human sciences? Gadamer has pointed this out in his work "Philosophical Foundations of the Twentieth Century" in *Philosophical Hermeneutics* (Berkeley: University of California Press, 1977).

<sup>44</sup> Cf. Malachi Haim Hacohen, "Karl Popper in Exile," *Philosophy of the Social Sciences*, Vol. 26, Issue 4 (December 1996), pp. 452-493. Popper seems to love his work more than his wife.

<sup>45</sup> *LScD*, 19.

<sup>46</sup> *P1*, 80.

<sup>47</sup> *Ibid.* The *Postscripts* is not considered a metaphysical work.

<sup>48</sup> Roberta Corvi, *An Introduction to the Thought of Karl Popper* (London: Routledge, 1997), p.79. "Gnoseological arguments" refer to epistemological problems.

<sup>49</sup> *Ibid.*

The second issue to be resolved is Popper's "problem-shift" towards metaphysics. His readers accuse him of being inconsistent. At one instance he claimed to have abstained from doing metaphysics, and at another time he claimed to be a champion of it.<sup>50</sup> In the *Unended Quest*, Popper writes: "At the time I was not at all interested in metaphysics. It was only later that I extended my "*criterion of demarcation*" to metaphysics."<sup>51</sup> But in other works, he affirms: "But the fact is that throughout my life I have combated positivist epistemology, under the name 'positivism'."<sup>52</sup> And "I have always been a *metaphysical realist*."<sup>53</sup>

Bartley observes that Popper was more positivistic and anti-metaphysically inclined in the 1930s. "...his [Popper] writings occasionally suggest that he regards metaphysics as at best a necessary evil; he frequently uses the maxim: 'Irrefutability is not a virtue but a vice'. It may be argued that Popper has in his later work begun to emphasize metaphysics more."<sup>54</sup> Agassi agrees. "A remnant of positivist prejudice may perhaps be detected in Popper's lumping together (like Bacon and unlike Whewell) of a few kinds of nonscientific theories, including metaphysics, pseudo-science, and superstition, under the one label 'metaphysical'."<sup>55</sup> Freeman and Skolimowski divide Popper's philosophy into two periods: the methodological period, which lasted up to 1960, and the metaphysical period, which begins afterwards.<sup>56</sup> Margenau's division is "metaphysical or methodological and the empirical."<sup>57</sup> Popper

---

<sup>50</sup> Cf. Bagood, p. 282.

<sup>51</sup> *UQ*, 41. Cf. *RC*, 1067-1068.

<sup>52</sup> *The Myth of the Framework* (1994) [Henceforth *MF*], 30.

<sup>53</sup> *RC*, 963. He maintains his consistency regarding metaphysics. Cf. *P1*, 80; *LScD*, secs.4, 28 & 79.

<sup>54</sup> William Bartley III in Imre Lakatos and Alan Musgrave, eds. *Problems in the Philosophy of Science* (Amsterdam: North-Holland Pub. Co., 1968), p. 49.

<sup>55</sup> Joseph Agassi in Mario Bunge, ed. *The Critical Approach to Science and Philosophy. Essays in Honor of Karl Popper* (London: The Free Press, 1964), p.196.

<sup>56</sup> Freeman and Skolimowski in Schilpp, 485.

<sup>57</sup> *Ibid.*, 753. "Here we encounter the problem of validation, of testing, of falsification to which Popper pays so much careful attention. It has two parts, one metaphysical (or, if you detest that term, methodological) and one empirical." See also pp. 963-976.

does not disagree with this periodization, especially with regards to the methodological period "1958 or 1960."<sup>58</sup>

In the *Postscript*, Popper clarifies that metaphysical and methodological are not two separate things. The methodological is metaphysical. "As I tried to make clear in 1934 (*LScD.*, p.37; and sections 10 and 11), I do not regard methodology as an empirical discipline, to be tested, perhaps, by the facts of the history of science. It is, rather, a philosophical – a metaphysical – discipline, perhaps partly even a normative proposal."<sup>59</sup> Thus, Margennau's division is the more appropriate one.

Munz observes that there is "no sharp break" in Popper's thought. His ideas in the 1960s and 1970s grew from his solution to the problem of induction.<sup>60</sup> Musgrave also objects to these divisions.<sup>61</sup> Accordingly, Popper has been consistent in his anti-positivistic and pro-metaphysical position.

If there is really any 'metaphysical turn' in Popper, it is more a question of emphasis.<sup>62</sup> His later writings are more metaphysically oriented, dealing with what he calls, "metaphysical research programmes". Thus, it may be said that although Popper has been consistent in his metaphysics, there is a change in his attitude towards it. "In the 1940's Popper came to a slightly different position: that not all metaphysical theories were as good as one another, so one could argue reasonably between various metaphysical positions. Such theories can be judged by the standards of logical coherence, compatibility with well-tested scientific theory, and the ability to solve the problem for which they were introduced."<sup>63</sup>

---

<sup>58</sup> *RC*, 1069.

<sup>59</sup> *P1*, xxv.

<sup>60</sup> Munz, 12.

<sup>61</sup> In Imre Lakatos and Alan Musgrave, eds., *Problems in the Philosophy of Science* (Amsterdam: North-Holland Pub., Co., 1968), p.84. Henceforth, Lakatos and Musgrave.

<sup>62</sup> Cf. *UQ*, 150.

<sup>63</sup> Cf. Alain Boyer in Percival, Ray, "Report on annual one-day conference on the philosophy of Sir Karl Popper," *The Popper Newsletter* (4) . <http://www.eeng.dcu.ie/~tkpw/newsletter/v4ni-2/node32.html>, Net-surfing Date: 1/4/98. Emphasis mine.

There is, therefore, no radical problem-shift in Popper. The 'shift' is in his attitude towards metaphysics. Whereas earlier he thought that all metaphysical concepts are non-criticizable, he later on accepted that although they are non-falsifiable, some of them could be criticizable.<sup>64</sup>

### Popper the Metaphysician

Could Popper be considered a metaphysician? In Paul Schilpp's volumes, there is no explicit commentary on Popper's metaphysics. However, there are two essays written by his former students, Joseph Agassi and W.W. Bartley III on this issue. Bartley's article is "Theories of Demarcation Between Science and Metaphysics"<sup>65</sup>; and Agassi's article "The Nature of Scientific Problems and Their Roots in Metaphysics."<sup>66</sup>

To the question as to when did he publicly express his metaphysical orientation, Popper answers as a response to Bartley's article. "As early as 1933 I wrote a letter to the Editors of the positivistic journal *Erkenntnis* in which I said of metaphysics that 'from a historical point of view [metaphysics] can be seen to be the source from which the theories of the empirical sciences spring.'<sup>67</sup> He goes on to affirm that he is a metaphysical realist.<sup>68</sup> He is convinced of the "important historical role played by metaphysics in the formation of scientific theories."<sup>69</sup>

So far, the term 'metaphysical realism' has been propping up, but before it will be discussed, let us see Popper call himself a metaphysi-

---

<sup>64</sup> *UQ*, 150.

<sup>65</sup> In Lakatos and Musgrave, 40 -119.

<sup>66</sup> In Bunge, 189-211.

<sup>67</sup> *RPDR*, 93.

<sup>68</sup> *Ibid.* Reacting to Bartley, he says: "I also made it clear in my *Logic of Scientific Discovery* (explicitly on p.252) that I myself was, metaphysically, a realist. I still am a metaphysical realist, and an epistemological optimist in the sense that I hold that the truthlikeness ('*verisimilitude*') of our scientific theories can increase: this is how our knowledge grows."

<sup>69</sup> *MF*, 30. "Moreover, I have taught, for more than thirty-eight years, that all observations are theory-impregnated, and that their *main function* is to check and refute, rather than to prove, our theories. Finally I have not only stressed the meaningfulness of metaphysical assertions and the fact that I am myself a metaphysical realist, but I have also analysed the important historical role played by metaphysics in the formation of scientific theories." (Emphasis mine)

cian, "a tottering old metaphysician."<sup>70</sup> For him, metaphysics is meaningful, important and interesting.<sup>71</sup> And what does he mean by "metaphysical"? "I mean here by 'metaphysical' something like 'not empirically testable'."<sup>72</sup> It is not understood in the context of classical ontology although it may be included in it. "I do not think that there is any such thing as ontology, or a theory of being, or that an ontology can be seriously attributed to Parmenides."<sup>73</sup>

The following are considered by Popper as metaphysical: 1) pseudo-scientific theories such as Freud's psychoanalysis, Adler's individual psychology and Marx's materialist interpretation of history;<sup>74</sup> 2) metaphysical beliefs (religious or moral convictions) absorbed from tradition;<sup>75</sup> 3) occult ideas,<sup>76</sup> superstitions and dreams, 4) ideologies,<sup>77</sup> 5) myths and primitive beliefs, 6) pre-scientific dogmatic thinking<sup>78</sup>, 7) and the "mysterious/mystical" knowledge such as the existence of the laws of nature.<sup>79</sup> Popper also considers his own methodology as metaphysical.<sup>80</sup> Metaphysics, thus, becomes an all-encompassing concept referring to statements that are not empirically testable or falsifiable. Popper believes that metaphysics is not so much the result of "micro-

<sup>70</sup> *RC*, 993. Cf. *P3*, 31-32; Corvi, 80.

<sup>71</sup> See Percival. Cf. *P1*, 194.

<sup>72</sup> *P1*, 194. Emphasis mine. See also p.108.

<sup>73</sup> *TWOP*, 114. Cf. *P2*, 7, fnnt3. He avoids using the term "because of the fuss made by some philosophers over 'ontology'." He is not sure on this, thus he dismisses "that questions of terminology are never important."

<sup>74</sup> *P1*, 162.

<sup>75</sup> *Ibid.*, 92. Cf. *P2*12. "...primitive metaphysics is closely related to magic."

<sup>76</sup> *Ibid.*, 108. In Berkeley, 'occult' means "invisible structure properties of an unseen and invisible world." Popper is not afraid of 'occult' scientific concepts, but he does not believe in ghosts. (See fnnt 4)

<sup>77</sup> *MF*, 30.

<sup>78</sup> *UQ*, 41.

<sup>79</sup> *P1*, 150-152. "We must, I believe, accept the existence of the laws of nature...as a mystery..." Also *P1*, 74-75. Time and "space" belongs to metaphysical cosmology. (*P1*, 78) He does not accept the principle of universal causation (determinism) but in the existence of at least one true law of nature. (*P1*, 79).

<sup>80</sup> *Ibid.*, xxv.

physical theory... but by the problems of physical cosmology.”<sup>81</sup> This in turn leads to biology and evolutionary epistemology. However, it is not used to support epistemological theory.<sup>82</sup> Metaphysics, cosmology and epistemology are not to be studied separately but as interrelated disciplines.

With regards to metaphysical realism, Popper describes it as follows: 1) it is true and reasonable but not demonstrable and testable;<sup>83</sup> 2) it serves as background for the search for truth<sup>84</sup>; 3) it accepts the reality of the physical world,<sup>85</sup> its metaphorical physical laws,<sup>86</sup> and its mysterious homogenous structure;<sup>87</sup> 4) it presupposes that knowledge is objective, and there is truth, but one may not be certain whether he has attained it (verisimilitude). Here, the metaphysical agnosticism of Kant is apparent. Actually, Popper defends metaphysical realism by attacking idealism and solipsism. After which he says that there is no more need to give positive arguments for it, because metaphysical realism is “obviously true.”<sup>88</sup>

This metaphysical realism presents a new picture of the physical world. “All properties of the physical world are dispositional, and all the real state of a physical system, at any moment, may be conceived as the sum total of its dispositions – or its potentialities, or possibilities, or propensities.”<sup>89</sup> Change is the realization or actualization of these potentialities, “consisting of changing propensities for change.”<sup>90</sup>

Popper also noted that the positivists’ attack against metaphysics is primarily directed against religious metaphysics or “rational the-

---

<sup>81</sup> P3, 31.

<sup>82</sup> P1, 81.

<sup>83</sup> *Ibid.*, 83, 85.

<sup>84</sup> *Ibid.*, 81.

<sup>85</sup> P3, 2.

<sup>86</sup> P1, 102. See also pp, 71-72, 150. There are true natural laws or at least one such law.

<sup>87</sup> *Ibid.*, 152.

<sup>88</sup> *Ibid.*, 85.

<sup>89</sup> P3, 159.

<sup>90</sup> *Ibid.*, 160.

ology.”<sup>91</sup> He calls theological statements as “arch-metaphysical assertion.” By this Popper is referring to “the assertion of the existence of a personal God, that is to say, of an omnipotent, omnipresent, omniscient, and personal spirit.”<sup>92</sup>

Popper claims that even this could be given empirical meaning. He argues:

“ ‘*x* is omnipresent’ can be defined by generalizing the idea ‘*x* can put the thing *y* into the place *z*’: this idea belong to the ordinary life and is therefore sufficiently empirical. And although its generalization, ‘*x* can put anything anywhere’ is, perhaps, no longer empirical, it is definable by the application of a very ordinary logical operation to an empirical term, and therefore clearly meaningful.”<sup>93</sup>

“Omnipresence is even easier to define by generalizing the empirical predicate ‘*x* is located at the place *y*’. The result is ‘*x* is located at all places’. The terms ‘omniscience’ and ‘person’ can both be defined together, with the help of the predicate ‘*x* knows *y*’. We can say that *x* is a person if and only if there is a *y* and *x* knows *y*; and we can say that *x* is omniscient if and only if *x* is located somewhere, and if *x* knows every *y*. As to spirit, an omnipresent person may be said to be a spirit. In this way, we may give ‘empirical meaning’ to rational theology. Yet it remains metaphysical: not because it is meaningless, but because its assertions cannot be tested – because they are irrefutable.”<sup>94</sup>

Thus, metaphysics could be reconciled with empiricism “if only we take seriously the hypothetical character of all ‘scientific knowledge’ and the critical character of all rational discussion.”<sup>95</sup>

To show that he is not alone in this position, Popper quotes Einstein who also considers the importance of metaphysics. “A disastrous fear of metaphysics... [is the] malady of contemporary empiricist philosophizing.... This fear seems to be the motive of interpreting, for

<sup>91</sup> *Ibid.*, 213.

<sup>92</sup> *Ibid.*

<sup>93</sup> *Ibid.*

<sup>94</sup> *Ibid.*, 213.

<sup>95</sup> *Ibid.*, 88.

example, a 'thing' as a 'bundle of qualities' – 'qualities' which may be discovered, it is assumed, among the raw material of our sense...I, on the contrary, do not think that any dangerous kind of metaphysics is involved in admitting the idea of a physical thing (or a physical object) as an autonomous notion into the system, together with the spatio-temporal structure appropriate to it."<sup>96</sup>

### The Demarcation Between Metaphysics and Science

Popper considers the problem of demarcation as highly significant and of practical importance because all the main problems of science are linked with it. It is also connected to the problem of knowledge.<sup>97</sup> He first considered this problem in 1919.<sup>98</sup> "*I wished to distinguish between science and pseudo-science; knowing very well that science often errs, and that pseudo-science may happen to stumble on the truth.*"<sup>99</sup> This demarcation was extended to metaphysics.<sup>100</sup> Later, Popper's interest started to include the problem of induction.<sup>101</sup> By induction he means "an argument which, given some empirical (singular or particular) premises, leads to a universal conclusion, a universal theory, either with logical certainty, or with 'probability' (in the sense in which this term is used in the calculus of probability)."<sup>102</sup> The very problem of induction is its invalid inference from particular observations towards the formulation of a universal theory or law. This is also called the Humean problem.<sup>103</sup> These two problems are interrelated, because verifiability, the widely held criterion of demarcation, is fruit of an inductive process. David Miller presents these two problems as the main gist of Popper's first book *The Two Fundamental Problems of the Theory of Knowledge* written in 1930-32.<sup>104</sup> The solution to the prob-

---

<sup>96</sup> Einstein quoted in *Ibid.*, 80.

<sup>97</sup> *P1*, 161-162.

<sup>98</sup> *CR*, 33. Cf. *P1*, 162.

<sup>99</sup> *RPDR*, 91. Cf. *LScD*, 315.

<sup>100</sup> *UQ*, 41.

<sup>101</sup> *Ibid.*, 92.

<sup>102</sup> *P1*, 147.

<sup>103</sup> *LScD*, 34.

<sup>104</sup> *PS*, 12.

lem of demarcation likewise serves for the resolution of the problem of induction. "The problem of demarcation is to find a criterion that permits us to distinguish between statements that belong to the empirical sciences (theories, hypotheses) and other statements, particularly pseudo-scientific, prescientific, and metaphysical statements; but also mathematical and logical statements."<sup>105</sup> This may be translated into an interrogation: "what distinguishes scientific theories from metaphysical statements?" *Popper's solution*: "Hence I suggested that *testability* or *refutability* or *falsifiability* should be accepted as a criterion of the scientific character of theoretical systems; that is to say, *as a criterion of demarcation between empirical science on the one hand and pure mathematics, logic, metaphysics, and pseudo-science on the other.*"<sup>106</sup>

Popper came up with this solution by applying the logic of situation to the history of science, or "situational analysis."<sup>107</sup> Applied situational logic implies the reconstruction of the "problem situation" wherein a theory is discovered or invented. It is "the situation of a scientist probing into the unknown reality behind the appearances, and anxious to learn from mistakes."<sup>108</sup> Thus, Popper arrives at the concept of *falsifiability* by analyzing the status of scientific problems and the situations that led to its growth.<sup>109</sup> This concept will be discussed further below. For the moment, it is sufficient to say that: 1) falsifiability is the criterion of demarcation between science and metaphysics; 2) it rejects the inductive or verifiability method of science; 3) it is a hypothetico-deductive system<sup>110</sup>; 4) it is not a meaning criterion.<sup>111</sup>

The method of induction is not applicable because all theoretical statements transcend experience. Ideas or terms do not really equate to the empirical reality. They are always formed in the light of theo-

---

<sup>105</sup> *P1*, xix. See also pp. 159, 174-175. Cf. *LScD*, 34; *UQ*, 42.

<sup>106</sup> *P1*, 174-175. See also p.159. Popper included pure mathematics and logic in the category of metaphysics. Why he did so will not be discussed in this study.

<sup>107</sup> *Objective Knowledge: An Evolutionary Approach* (1972) [Henceforth *OK*], 179. Cf. *P2*, 21; *The Poverty of Historicism* (1944) [Henceforth *PH*] sec.31; *The Open Society and its Enemies*, vol. 2 (1945) [Henceforth *OSE2*], ch.14; Sergio L. De C. Fernandes, 3.

<sup>108</sup> *P1*, xxv.

<sup>109</sup> See *CR*, 66-96; *SB*, 151 ff; *OK*, 166-190.

<sup>110</sup> Peter Medawar in Schilpp, 285. "The first strongly reasoned and fully argued exposition of a hypothetico-deductive system is unquestionably Karl Popper's."

ries, "*we are theorizing all the time*, even when we make the most trivial singular statement. [...] even ordinary singular statements are always *interpretations of 'the facts' in the light of theories*."<sup>112</sup> It is also in this light that exact repetitions are always "approximate repetitions." Verifiability therefore could never be a reliable criterion. "All universal concepts incorporate theories. And although some of these can be tested, they can never be exhaustively tested (and can never be verified)."<sup>113</sup>

In Wittgenstein's program,<sup>114</sup> metaphysical statements are meaningless because they cannot be empirically verified. For example, the statement "Good angels are in heaven" is sheer nonsense. There is no observable being that can be called an angel, and there is no spacio-temporal location equivalent to heaven. Statements like these are not scientific and therefore one can only be silent.

Popper argues that this criterion "leads to a demarcation that is at once *too narrow and too wide*: it will exclude nearly all it is intended to include, and it will include much of what it is intended to exclude."<sup>115</sup> In doing so, said criterion unintentionally "declared scientific theories to be meaningless, and it thereby placed them (again unintentionally) on the same level as metaphysics"<sup>116</sup> The following observations may be legitimately hurled against verifiability:

1) The criterion of verifiability is not itself verifiable, therefore also metaphysical and meaningless.

2) Metaphysical statements can be meaningful; they can be understood. More so, theological statements like the existence of God (cited above) can be translated into empirical statement.

3) Verifiability does not solve the problem of induction. It is an invalid inference to come up with a generalization from particular ob-

---

<sup>111</sup> Cf. *P1*, 176; *LScD* sec.4 & 10; *OSE2*, chap.11; *UQ*, sec.8 & 16; *CR*, chaps.1-3.

<sup>112</sup> *LScD*, 423.

<sup>113</sup> *P1*, 109. See also p.5.

<sup>114</sup> *Ibid.*, 195. 1) "non-verifiable utterances are meaningless because they violate the grammatical rules of language: *Tractatus* 5.473 to 5.47321; 2) that they are meaningless because they employ words or expressions although a meaning has not been given to them: *Tractatus* 5.473 to 5.4733, and 6.53"

<sup>115</sup> *Ibid.*, 214. Emphasis mine.

<sup>116</sup> *Ibid.*, 175.

servations. For example, the statement "All swans are white" can not be verified because one cannot observe all the swans in the whole world and at all times.

4) Many scientific theories are preceded by metaphysical ideas.

5) Therefore, falsifiability is the criterion of demarcation between science and metaphysics. It solves the problem of induction because it does not accept induction. It is a hypothetico-deductive method. It escapes the vicious circle of empirical testability because this principle does not claim to be empirical. It acknowledges the meaningfulness of metaphysical statement and its role in the development of scientific knowledge.

Is falsifiability also falsifiable? "For my answer is that my theory is not empirical, but methodological or philosophical, and it need not therefore be falsifiable. Falsifiability is a criterion of demarcation, not one of meaning. [...] Thus, trivially, the criterion of demarcation must not be applied to it."<sup>117</sup>

Popper admits that this demarcation "must be rough." This is because "the transition between metaphysics and science is not a sharp one: what was a metaphysical idea yesterday can become a testable scientific theory tomorrow."<sup>118</sup> It is possible for metaphysical ideas to become a scientific theory. Likewise, it is impossible to remove all metaphysical elements in the empirical sciences.<sup>119</sup> He accedes also to the observation that there are scientific theories that turned out to be metaphysical. "Of course, there have been developments in the opposite direction too: as some positivists are fond of saying, a considerable number of metaphysical doctrines can be shown to be the echoes of obsolete doctrines of science."<sup>120</sup>

Even though the demarcation is rough, Popper is still convinced that "it is more than sharp enough to make a distinction between many physical theories on the one hand, and metaphysical theories, such as psychoanalysis, or Marxism (in its present form), on the other."<sup>121</sup>

---

<sup>117</sup> RC, 1010.

<sup>118</sup> *Ibid.*, 981. Cf. P1, 159, 161.

<sup>119</sup> P1, 179. See the topic "The Attack on Metaphysics" in this study.

<sup>120</sup> *Ibid.*, 160.

<sup>121</sup> RC, 984.

### a. *Falsifiability*

In *Unended Quest*, Popper says that he is against the verifiability criterion of the Logical Positivists but he agrees with them regarding the critical attitude.<sup>122</sup> In the *Postscript* he talks as if falsifiability is the same with critical attitude;<sup>123</sup> ["the method of testing a theory as severely as we can – that is, the method of criticism, the *method of looking for falsifying instances*."] <sup>124</sup> Is falsifiability the same as critical rationalism?

Popper introduced the technical term 'falsifiable' or 'empirically refutable' in 1933 in connection with the solution to the problem of demarcation. Falsifiability, testability, refutability,<sup>125</sup> and fallibilism are terms used by Popper synonymously. It is the criterion of demarcation. A statement, a theory or conjecture, belongs to empirical sciences "if and only if it is falsifiable." This can be described as follows:

1.) It uses the deductive method, specifically, *modus tollens*.<sup>126</sup>

2.) It excludes "some immunizations" against criticism.<sup>127</sup> This means that an *ad hoc* hypothesis should not be arbitrarily forwarded just to save a theory.

3.) It "is needed by the scientist as well as the philosopher in certain concrete difficulties."<sup>128</sup>

4.) It is inspired by Kant. "He was right to believe that knowledge was *genetically or psychologically* a priori, but quite wrong to suppose that any knowledge could be a priori *valid*."<sup>129</sup>

5.) It is the standard in the "competition between theories – a kind of Darwinian struggle for survival."<sup>130</sup> "According to my proposal,

<sup>122</sup> *UQ*, 89.

<sup>123</sup> *P1*, 175.

<sup>124</sup> *Ibid.*, 163.

<sup>125</sup> *Ibid.*, 159, 174. See also p.xix.

<sup>126</sup> *UQ*, 79. Cf. *LScD*, 42; *P1*, 221. Deduction is used as an instrument of criticism.

<sup>127</sup> *Ibid.*, 42.

<sup>128</sup> *P1*, 189.

<sup>129</sup> *UQ*, 60.

<sup>130</sup> *Ibid.*, 79.

what characterizes the empirical method is its manner of exposing to falsification, in every conceivable way, the system to be tested. Its aim is not to save the lives of untenable systems but, on the contrary, to select the one which is by comparison the fittest, by exposing them all to the fiercest struggle for survival."<sup>131</sup>

6.) It is prohibitive. *Via negativa*. "It became clear to me that what made a theory, or a statement, scientific was its power to rule out, or exclude, the occurrence of some possible events – to prohibit, or forbid, the occurrence of these events. Thus *the more a theory forbids, the more it tells us*." <sup>132</sup>

7.) It is realistic. "*In so far as a scientific statement speaks about reality, it must be falsifiable: and in so far as it is not falsifiable, it does not speak about reality.*" <sup>133</sup>

8.) It is capable of clashing with experience and could be empirically tested. It is a method which consists of conjecture and refutations, error-elimination process. <sup>134</sup>

9.) It is applied only to "theoretical systems rather to statements picked out from the context of a theoretical system."<sup>135</sup> It could not be applied to pure existential statements because they are non-testable; although there are some existential statements that are falsifiable because they belong to a testable scientific context. For example - "there exists an element with the atomic number 72." <sup>136</sup>

In the *Postscript*, Popper clarifies the meaning of falsifiability:

a. "Falsifiable' as a logical-technical term, in the sense of the demarcation criterion of falsifiability. This purely logical concept – falsifiable in principle, one might say – rests on a logical relation between the theory in question and the class of basic statements (or the potential falsifiers described by them)."

---

<sup>131</sup> *LScD*, 42.

<sup>132</sup> *UQ*, 41.

<sup>133</sup> *LScD*, 314.

<sup>134</sup> *Ibid.*, 313-314; 40-41. Cf. *CR*, 36.

<sup>135</sup> *P1*, 178.

<sup>136</sup> *Ibid.*

b. "Falsifiable' in the sense that the theory in question can *definitely* or *conclusively* or *demonstrably* be falsified ('demonstrably falsifiable'). I have always stressed that even a theory which is obviously falsifiable in the first sense is never falsifiable in this second sense. (For this reason *I have used the expression 'falsifiable' as a rule only in the first, technical sense.* In the second sense I have as a rule spoken not of 'falsifiability', but rather of 'falsification' and of its problems.)"<sup>137</sup>

Popper has consistently said that the use of the term refers to the logical technical sense.<sup>138</sup> More so it has "nothing to do with the question whether or not certain possible experimental results would be accepted as falsifications."<sup>139</sup> It does not also refer "to a *conclusive practical experimental proof* of falsity", because such proof to settle an empirical question is non-existent.<sup>140</sup> Falsifiability as a criterion of demarcation is all logical. Hence, it is similar to critical rationalism.

### **b. Corroboration**

The more a theory is falsifiable, the more that it should be corroborated. Popper posits a "degree of corroboration" of theories. This means "the grade of hypothesis, or the degree to which it has stood up to tests."<sup>141</sup> The original term he used was actually *Bewahrungsgrad* or *Grad der Bewahrung*, translated by Carnap as 'degree of confirmation'. At first he acceded to this translation but later on withdrew due to its inductive implication. Hugh N. Parton suggested to him 'degree of corroboration'. This may well be understood as "grade of hypothesis", or "graded by tests".<sup>142</sup>

Corroboration is basically an experimentation that admits the role of empirical observation. A counter-example is a corroboration of

---

<sup>137</sup> *Ibid.*, xxii. Emphasis mine. Cf. Popper Selections, edited by David Miller (1985) [Henceforth PS], 150.

<sup>138</sup> *Ibid.*, xxi. This "does not mean that a falsification can in practice be carried out, or that, if it is carried out, it will be unproblematic."

<sup>139</sup> *Ibid.*, xx.

<sup>140</sup> *Ibid.*, xxii.

<sup>141</sup> *Ibid.*, 220.

<sup>142</sup> *Ibid.*, 228-230.

theories.<sup>143</sup> Degree of corroboration is also a factor for preference of theories. A rational preference of one theory over another is also a theory of corroboration.<sup>144</sup> The better corroborated, the more preferable is the theory.

### Critical Rationalism

Critical attitude, critical approach, critical rationalism, critical theory, and rationality are all synonymous.<sup>145</sup> Popper is explicit that the critical approach is the solution to the problem of induction.<sup>146</sup> Actually, everything that is said of falsifiability applies also to critical rationalism. The difference is that it has wider applications. It is the criterion of demarcation between science and metaphysics, and between criticizable and non-criticizable metaphysical ideas.<sup>147</sup> It is the unifying method of all sciences. Thus, Popper equates the task of philosophy with critical rationalism. It is the "duty" of scientists, philosophers, and all those who want to advance in knowledge to be critical.<sup>148</sup> Rational criticism is Popper's emphasis.<sup>149</sup>

#### a. *The Irrationality of Man*

If Popper demands that man should be rational, does he presuppose that man is a rational animal? It seems not so. As quoted in the 'Introduction' of this study, he says that man is not so much a rational

<sup>143</sup> *Ibid.*, 234.

<sup>144</sup> *Ibid.*, xiv.

<sup>145</sup> *LScD*, 16. "I have italicized the words 'critical discussion' and 'critically' in order to stress that I equate the rational attitude and the critical attitude. [...] Yet criticism will be fruitful only if we state our problem as clearly as we can and put our solution in a sufficiently definite form – a form in which it can be critically discussed." Cf. Lakatos and Musgrave, 97. See also *OSE2* chap. 24. An explanation of the terms 'reason', 'rationalism', and 'rationality' is also found in *RC*, 1085-1086. Rationality is criticism (*P1*, 52).

<sup>146</sup> *P1*, 18 ff.

<sup>147</sup> *LScD*, 206, ftnt.2; 438; *MF*, 117.

<sup>148</sup> *P3*, 34. "As I see it, criticism is the duty the scientist and of anyone who wants to advance knowledge. Seeing new problems and having new ideas, on the other hand, are not one's duty: originality is, rather, a gift of the gods."

<sup>149</sup> *P1*, xxxii.

animal but an ideological animal.<sup>150</sup> This is so because man does not always act rationally. Hitler's extermination of Jews and the Germans' near-deification of him during the Nazi Era, were not rational acts. Man *should* be rational, because he is always confronted with problems.

He is "a being who is forever faced by problems, theoretical or practical, raised by an alien environment and with no guarantees from any source that his solutions are the right one, and his survival depending on his being able and willing to alter or adapt his solutions in the light of experience."<sup>151</sup> "Life consists in problem-solving."<sup>152</sup> Watkins reiterates that "...all organisms are constantly, day and night, *engaged in problem-solving*."<sup>153</sup> Organisms develop by natural selection and blind variation, by the survival of the fittest, by competition, by trial and error-elimination procedure. All living beings are problem-solving beings.

Man's reasoning capacity is unlimited, yet limited in its power of prediction. Bartley summarizes Popper thus: "Popper argues that human reason is unlimited with regard to criticism yet limited with regard to its powers of prediction; and shows that both the lack of limitation and the limitation are, in their respective places, necessary for human rationality to exist at all."<sup>154</sup>

Man has an inborn propensity to rationality. "*We move from the very start, in the field of intersubjectivity, of the give-and-take of proposals and of rational criticism.*"<sup>155</sup> Rational discussion and critical thinking are the "means of breaking out of prison- of liberating ourselves."<sup>156</sup> Through them, man learns, grows in knowledge and transcends himself. That is why Popper adopted the Enlightenment's caveat. *Sapere Aude!* Dare to be intelligent!

---

<sup>150</sup> RC, 1149.

<sup>151</sup> Burke, 133. Cf. "Natural Selection and the Emergence of the Mind" in *Evolutionary Epistemology, Rationality, and the Sociology of Knowledge*, ed. by Gerard Radnitzky and W.W. Bartley III, (1988, pp.139-155) [Originally published in *Dialectica* 22, 3, 1978, pp.339-355] [Henceforth NSEM], 150.

<sup>152</sup> *In Search of a Better World* (1992) [Henceforth ISBW], 16.

<sup>153</sup> Watkins in *Schilpp*, 391.

<sup>154</sup> P1, xv.

<sup>155</sup> *Ibid.*, 73.

### **b. *The Implications of Rationalism***

Foremost among them, is intellectual pluralism; the more competing theories the better. "More heads are better than one." Even if the conjectures may at first appear silly or unconventional, they should all first be subjected to criticism.<sup>157</sup> This implies the following: 1) the more different the background, the more fruitful the argument; 2) there is no need for a common language to begin with; 3) the partners in an argument should share: a) the wish to know, b) the readiness to learn from the other fellow, c) by severely criticizing his views – in the strongest possible version that can be given to his views, and d) hearing what he has to say in reply.<sup>158</sup> In the process, one also learns from his and the other's mistakes.

This is a dialectical and dialogical method, which is not far from coming to a "fusion of horizons," to an agreement.

A presupposition of a rational discussion is metaphysical realism. "It cannot exist without real problems, without the search for objective truth, without a task of discovery which we set ourselves, without a reality to be discovered – a reality to be explained by *structural universal laws*."<sup>159</sup> Other implications are the following:

1) Self-criticism. "The truth is that we must be constantly critical; self-critical with respect to our own theories, and self-critical with respect to our own criticism; and, of course, we must never evade an issue."<sup>160</sup>

2) Consciousness of one's belief, and the ability to criticize them in order to come up with the best theory. It "means that we *must understand, examine, compare, and criticize* coherent systems of assumptions, that is to say, 'approaches', or 'isms' (such as inductivism, or positivism, or intuitionism)."<sup>161</sup> It is the task of philosophy to attack the framework itself.

<sup>156</sup> *Ibid.*, 155.

<sup>157</sup> *Ibid.*, 69.

<sup>158</sup> *Ibid.*, 7.

<sup>159</sup> *Ibid.*, 157. Cf. *UQ*, 104.

<sup>160</sup> *RC*, 984. Cf. *P1*, 27. "What distinguishes the attitude of rationality is simply openness to criticism."

<sup>161</sup> *P1*, 17. Emphasis mine.

3) An attitude of cooperation in view of truth.<sup>162</sup>

4) Not a psychological state, but rather a procedure and policy. "As it happens, it is for stylistic reasons that I prefer the phrase "critical attitude" to "critical procedure" or to "critical policy"; I surely mean by attitude nothing more psychological (as Musgrave admits) than procedure or policy. [...] I should be careful always to write "critical approach" instead of "critical attitude" [...] After all I have no desire to mislead people by terminology, and I am sorry when it happens."<sup>163</sup>

5) Not a technique, but an imaginative and creative process.<sup>164</sup> Thus, there is "no routine procedure... not all is logic in our never ending search for truth."<sup>165</sup>

6) Not a theory of justification. "...I stressed that I had *rejected all attempts at the justification of theories, and that I had replaced justification by criticism: we can never justify a theory.*"<sup>166</sup>

7) It is a method of trial and error, conjecture and refutation.<sup>167</sup> It is the most important activity in the history of science.<sup>168</sup>

### ***c. Immanent and Transcendent Criticism***

Accordingly, there are two kinds of criticisms. "A piece of criticism is called 'immanent criticism' if it attacks a theory from within, by

<sup>162</sup> RC, 1085-1086. "It is fundamentally an attitude of admitting that "I may be wrong and you may be right, and by an effort, we may get nearer to the truth". It is an attitude which does not lightly give up hope that by such means as argument and careful observation, people may reach some kind of agreement on many problems of important; and that, even where their demands and their interests clash, it is often possible to argue about the various demands and proposals, and to reach – perhaps by arbitration – a compromise which, because of its equity, is acceptable to most, if not to all. In short, the rationalist attitude, or, as I may perhaps label it, the "attitude of reasonableness", is very similar to the scientific attitude, to the belief that in the search for truth we need cooperation, and that, with the help of argument, we can in time attain something like objectivity."

<sup>163</sup> RC, 1079.

<sup>164</sup> P1, 180.

<sup>165</sup> *Ibid.*, 189.

<sup>166</sup> UQ, 149.

<sup>167</sup> *Ibid.*, 86.

<sup>168</sup> P3, 32.

adopting all its assumptions or presuppositions, and only these; and it is called 'transcendent criticism' if it attacks a theory from without, proceeding from assumptions or presuppositions which are foreign to the theory criticized."<sup>169</sup> The latter is the most important criticism because it gives the "what" and "why" a certain theory is preferable than its competitors.

In the process of criticism, the defense of theories is legitimate. "There is room in science for debate: for attack and therefore also for defence. Only if we try to defend them can we learn all the different possibilities inherent in our theories. As always, science is conjecture. You have to conjecture when to stop defending a favourite theory, and when to try a new one."<sup>170</sup>

#### ***d. Rationality in Science and Metaphysics***

The topic on science will be thoroughly discussed in the next part. It is however imperative to point out that rational criticism is the method of science.<sup>171</sup> It is the most important activity in the history of science.<sup>172</sup> It distinguishes science from other intellectual activities.<sup>173</sup> Science is always rational. This does not however mean that what is rational always belongs to science. Some metaphysical knowledge is criticizable too.

Is critical rationalism criticizable too? Yes! But Popper believes that it is the best reasonable theory. Thus, it has to be accepted as a dogma. Dogmatic thinking is needed in critical thinking. "[T]he dogma provides us with the frame of coordinates needed for exploring the order of this new unknown and possibly in itself even somewhat chaotic world, and also for creating order where order is missing."<sup>174</sup> It is also

---

<sup>169</sup> *P1*, 29.

<sup>170</sup> *RC*, 984. Cf. *P1*, 70. "It is right to stick to a theory and not to lose hope too soon."

<sup>171</sup> *TWOP*, 152-153. Cf. *P1*, 17.

<sup>172</sup> *P3*, 32.

<sup>173</sup> *TWOP*, 147.

<sup>174</sup> *UQ*, 58. See also p.41.

needed so as not to lose brilliant ideas.<sup>175</sup> But 'dogma' here is not understood as final and absolute. It can be criticized. Metaphysics can be criticizable and reasonable. A preference of a metaphysical theory over another may be rationally defensible.<sup>176</sup> A persuasion, belief and preference is called 'reasonable' "if it is arguable, and if it withstands *searching critical arguments* – ingenious attempts to show that it is not true, or not nearer to the truth than its competitors."<sup>177</sup>

If some form of dogmatism is fruitful, if metaphysics is criticizable, then rational criticism as a criterion of demarcation is indeed "rough" and not "a very sharp criterion."<sup>178</sup> Aside then from critical rationalism, there are other factors that should be considered. The scientific status of theories depends on "factors such as their simplicity, symmetry, and explanatory power, and on the way they have stood up to critical discussion and to the crucial experimental tests; and on their truth (correspondence to reality), or nearness to truth."<sup>179</sup>

The critical discussion could be definitive regarding the superiority of one theory over another in view of falsity, but not with regards to truth. A choice of a better theory is like cross-examining the contradicting witnesses. It is definitive regarding falsity alone because "the whole truth and nothing but the truth' is strictly speaking unattainable."<sup>180</sup>

## VII. METAPHYSICAL RESEARCH PROGRAMMES

Criticizable metaphysical knowledge is called by Popper "metaphysical research program' (MRP). The term was first used in the year 1949 "or earlier" but it was published only in 1958. It is the main topic of the last chapter of his *Postscript*.<sup>181</sup> Popper's collaborators (notably

---

<sup>175</sup> *P1*, 70. "A certain amount of dogmatism and pigheadedness is necessary in science if we are not to lose brilliant ideas which we do not act once know how to handle or to modify."

<sup>176</sup> *Ibid.*, 61.

<sup>177</sup> *Ibid.*, 59.

<sup>178</sup> *UQ.*, 42. Cf. *P1*, 159.

<sup>179</sup> *P3*, 41. See also *CR*, chap.10; *OK*, chap.2.

<sup>180</sup> *P1*, 60-61.

<sup>181</sup> *UQ*, 231.

Lakatos) acknowledge that this is the source of what they also call 'scientific research programs'.<sup>182</sup> Popper disagrees with them arguing that the word 'scientific' is not appropriate given that they are not yet testable.<sup>183</sup>

Most of these metaphysical research programs are "important cosmological theories", characterized by a two-fold character: a) "their programmatic character, often shaping and determining the course of scientific research and development; and b) their (at any rate at first) untestable, and thus metaphysical, character."<sup>184</sup> Popper further describes them as having "highly speculative character" but are "susceptible to criticism"<sup>185</sup> "They were highly speculative; and they were, originally, non-testable. Indeed they may all be said to have been more of the *nature of myths, or of dreams*, than of science. But they helped to give science its *problems*, its *purposes*, and its *inspiration*."<sup>186</sup> They are "attempts to formulate our *hopes*, our *inspiration*, and our *ambitions* concerning the growth of knowledge."<sup>187</sup> They are the 'blueprint' of the scientific project. Furthermore, Popper justifies his stand:

"I call these research programmes 'metaphysical' also because they result from general views of the structure of the world and, at the same time, from general views of the problem situation in physical cosmology. I call them 'research programmes' because they incorporate, together with a view of what the most pressing problems are, a general idea of what a satisfactory solution of these problems would look like. [...] They may be described as *speculative physics*, or perhaps as speculative anticipations of testable physical theories."<sup>188</sup>

Thomas Kuhn's 'paradigm' may be classifiable under this category.<sup>189</sup> "However, research programmes do not form part of science in

---

<sup>182</sup> P3, 32. Cf. UQ, 231.

<sup>183</sup> *Ibid.*

<sup>184</sup> *Ibid.*, 31. See also pp. 198-199.

<sup>185</sup> *Ibid.*, 172.

<sup>186</sup> *Ibid.*, 165. Emphasis mine. See also p. 176.

<sup>187</sup> *Ibid.*, 176. Emphasis mine.

<sup>188</sup> *Ibid.*, 161-162. Cf. P3, 31.

<sup>189</sup> P3, 31-32. "It seems that what Thomas S. Kuhn was to call 'paradigms' is

the way that Kuhn's dominant theories do. They are metaphysical, epistemological, and methodological in character."<sup>190</sup> Explicitly, Popper enumerated twenty metaphysical research programs in *Postscript 1* (pp. xxvi-xxx), and added ten more in *Postscript 3* (pp. 161-162). He culled them from the history of science.<sup>191</sup> The following also belong to this category: (a) propensity interpretation of probability, Newtonian idea of force;<sup>192</sup> (b) "exceptionless intrinsic regularities of nature" as metaphysical belief and which science is always groping for but "are too deep for us, and that we shall never discover them; (c) Tarski's theory of truth; "common realism;"<sup>193</sup> (d) determinism, idealism, irrationalism, voluntarism, nihilism;<sup>194</sup> the metaphysical programs "of explaining the (Carterian) extension of bodies with the help of a theory of forces" based on Leibniz and carried out in detail by Boscovitch,<sup>195</sup> (e) Principles of causality and the problem of objectivity,<sup>196</sup> (f) Darwin's theory of evolution;<sup>197</sup> (g) "Parmenides' cosmology together with his epistemology, logic, and methodology."<sup>198</sup>

Consistently, Popper considers his "dream programme" as metaphysical. This has its basis also on the metaphysical idea of indeter-

---

somewhat similar, although of course my point of view is radically different from his: I look upon these programmes in terms of a situation that can be rationally reconstructed, and see scientific revolutions as due, essentially, to rational criticism – that kind of activity which I regard as most important in the history of science."

<sup>190</sup> *TWOP*, 161.

<sup>191</sup> Cf. *P3*, 66. He admitted though that he is an amateur in the history of science.

<sup>192</sup> *RC*, 1129.

<sup>193</sup> *Ibid.*, 1094-1096.

<sup>194</sup> *RPDR*, 99. "I should perhaps also mention that in a broadcast given in 1957 entitled 'The problem of the irrefutability of philosophical theories' ...I discussed in detail how to criticize metaphysical theories. I took in this broadcast as my main examples (1) metaphysical determinism (also discussed at some length by me in 1950); (2) idealism; (3) irrationalism; (4) voluntarism; (5) nihilism (in Heidegger's version); and I tried to show how to criticize these metaphysical theories, and why I supported the metaphysics of (1') indeterminism; (2') realism; (3) rationalism; and in addition to these, also metaphysical views opposed to (4) and (5)." See also *CR*, 196.

<sup>195</sup> *MF*, 114.

<sup>196</sup> *LScD*, 55-56.

<sup>197</sup> *UQ*, 168.

<sup>198</sup> *TWOP*, 161.

minism.<sup>199</sup> His own theories are also metaphysical research programs. As long as a theory is criticizable yet untestable, it is a metaphysical research program. Thus, there can be countless research programs.

How then does one choose the best metaphysical research program? Again it is by rational criticism. The evaluation or appraisal of a theory should be based first in truth; secondarily it is also based on "practical usefulness" as distinct from fruitfulness. Here science and metaphysics are not different. Regarding the claim of metaphysics to be tentatively considered as true is the same with that of science. Popper states: "I no longer think, as I once, did that there is a difference between science and metaphysics regarding this most important point. I look upon a metaphysical theory as similar to a scientific one. It is vaguer, no doubt, and inferior in many other respects; and its irrefutability, or lack of testability is its greatest vice. But, *as long as a metaphysical theory can be rationally criticized*, I should be inclined to take seriously its implicit claim to be considered, tentatively, as true."<sup>200</sup>

A critical discussion of a rational theory, whether it is scientific or metaphysical, is rational because it is an attempt to solve problems in relation to a problem situation. Said discussion will touch the following issues:

- 1) "how well it solves its problems;
- 2) how much better it does so than various competing theories;
- 3) whether it does not create greater difficulties than those which it set out to dispel;
- 4) whether the solution is simple;
- 5) how fruitful it is in suggesting new problems and new solutions; and
- 6) whether we cannot, perhaps, refute it by empirical tests."<sup>201</sup>

---

<sup>199</sup> P3, 198-199.

<sup>200</sup> *Ibid.*, 199-200.

<sup>201</sup> *Ibid.*, 200. See also p. 211. Cf. P2, 44. Content, testability and simplicity are also considered. See also P1, 55. ["a) whether they solve the problem which they are supposed to solve; b) whether they explain what they are supposed to explain; c) whether they do not merely shift the problem by an untestable *ad-hoc* assumption; d) whether they are testable, and how well they are testable."

Only the last consideration is not applicable to metaphysics; the rest are. There are metaphysical theories which "cannot be rationally discussed."<sup>202</sup> "The comparison should be in terms of simplicity, coherence with certain other theories, unifying power, intuitive appeal and, above all, fruitfulness. Without wishing to commit myself to anything like pragmatism or instrumentalism, I think I should take the question of the *fruitfulness* of my programme as decisive."<sup>203</sup>

In metaphysical research programs, science and metaphysics could be combined. "We can combine the two, empiricism and metaphysical realism, if only we take seriously the hypothetical character of all 'scientific knowledge', and the critical character of all rational discussion."<sup>204</sup> Metaphysical research programmes are non-falsifiable but criticizable theories which serve as "heuristics" and "guide," "aspiration, and direction" for scientific research. They determine problem situations. They not only give the needed tools of scientific discovery but also help decide which scientific hypothesis is to be taken seriously. Metaphysical research programmes are similar to scientific research projects in as much as they share the same criterion of demarcation, that is, rational criticism.

The whole education of man is actually also a research program. He could not escape from such program. It is better to have a metaphysical theory than to have no theory at all.<sup>205</sup> But he should be cautious against being 'stuck in' or 'programmed by' any research program. The RULE is to criticize that program and if need be, to get out from that program.<sup>206</sup> □

---

<sup>202</sup> *Ibid.*

<sup>203</sup> *Ibid.*, 201. Emphasis mine.

<sup>204</sup> *P1*, 88.

<sup>205</sup> *Ibid.*, 172.

<sup>206</sup> Cf. *P3*, 33.