

# Vienna Circle

---

## **Mauro Murzi**

Member of Società Filosofica Italiana

[mauro@murzim.net](mailto:mauro@murzim.net)

<http://www.murzim.net>



# Table of Contents

- 1. Introduction.....5
- 2. History.....5
- 3. The Vienna Circle manifesto.....6
- 4. Unified Science.....7
- 5. Congresses and publications.....7
- 6. Quoted works.....9



## 1 Introduction.

Group of philosophers who gathered around Moritz Schlick when he was called to the Vienna University in 1922, organized in a philosophical association named Verein Ernst Mach (Ernst Mach Society). Among its members were Moritz Schlick, chairman of the Ernst Mach Society, Gustav Bergmann, Rudolf Carnap, Herbert Feigl, Philipp Frank, Kurt Gödel, Hans Hahn, Victor Kraft, Karl Menger, Marcel Natkin, Otto Neurath, Olga Hahn-Neurath, Theodor Radakovic, Friedrich Waismann. Members of the Vienna Circle had a common attitude towards philosophy, characterized by two main features: first, experience is the only source of knowledge; second, logical analysis performed with the help of symbolic logic is the preferred method for solving philosophical problems.

## 2 History.

Meetings on philosophy of science and epistemology began as early as 1907, promoted by Frank, Hahn and Neurath. They had roughly the same age, were born in Vienna, and had a common scientific background.

Hans Hahn, the older of the three (1879-1934), was a mathematician. He received his degree in mathematics in 1902; afterwards he studied under the direction of Boltzmann in Vienna and Hilbert, Klein and Minkowski in Göttingen, and in 1905 received the Habilitation in mathematics; he taught at Innsbruck (1905-1906) and Vienna (from 1909).

Otto Neurath (1882-1945) studied in Vienna and Berlin sociology, economics and philosophy; he received the degree in economics in 1905 at Berlin; from 1907 to 1914 he taught in Vienna at the Neuen Wiener Handelsakademie (Viennese Commercial Academy). Neurath married Olga, Hahn's sister, in 1911.

Philipp Frank, the younger of the group (1884-1966), studied physics in Göttingen and Vienna with Boltzmann, Hilbert and Klein; in 1907 he received the degree in physics and in 1912 held the chair of theoretical physics in the German University in Prague.

Their meetings were held in Viennese coffeehouses from 1907 onward. Frank remembered:

After 1910 there began in Vienna a movement which regarded Mach's positivist philosophy of science as having great importance for general intellectual life [...] An attempt was made by a group of young men to retain the most essential points of Mach's positivism, especially his stand against the misuse of metaphysics in science. [...] To this group belonged the mathematician H. Hahn, the political economist Otto Neurath, and the author of this book [i.e. Frank], at the time an instructor in theoretical physics in Vienna. [...] We tried to supplement Mach's ideas by those of the French philosophy of science of Henri Poincaré and Pierre Duhem, and also to connect them with the investigations in logic of such authors as Couturat, Schröder, Hilbert, etc. (cited from Uebel, Thomas, 2003, p.70).

The three friends participated also to the meetings of the Philosophical Society of the University of Vienna, from 1905 to 1927, where Frank discussed on philosophy of physics and Neurath on methodology of history of science and on social science and economics. Between the arguments that interested the Philosophical Society there was the analysis of Kantian philosophy of science and of contemporary classical mechanics.

The meetings of Hahn, Neurath and Frank on philosophy of science, French conventionalism, Mach's empiricism, Hilbert's logicism, were animated by an anti-Kantian attitude; however, Kant's philosophy was not dismissed as meaningless. Presumably the meetings stopped in 1912, when Frank went to Prague, where he held the chair of theoretical physics left vacant by Albert Einstein.

Hahn left Vienna during the World War I and returned in 1921. The following year Hahn, with the collaboration of Frank, arranged to bring Schlick at the University of Vienna, where Schlick held the chair of philosophy of the inductive sciences. Schlick had already published his two main works *Raum und Zeit in die gegenwärtigen Physik (Space and Time in contemporary Physics)* in 1917 and *Allgemeine Erkenntnislehre (General Theory of Knowledge)* in 1918. Under the direction of Schlick a new regular series of meetings began. Later Schlick and Hahn arranged to bring Carnap at the University of Vienna in 1926. In 1928 the Verein Ernst Mach (Ernst Mach Society) was founded, with Schlick as chairman, and in 1929 the Vienna Circle manifesto *Wissenschaftliche Weltauffassung. Der Wiener Kreis (The Scientific Conception of the World. The Vienna Circle)* was published. The pamphlet is dedicated to Schlick; its preface is signed by Hahn, Neurath and Carnap. In the appendix there is the list of the members of the Vienna Circle.

The Vienna Circle was dispersed when the Nazi party went into power in Germany; many of its members emigrated to USA, where they taught in several universities. Schlick remained in Austria, but in 1936 he was killed by a Nazi sympathizer student in the University of Vienna.

### 3 The Vienna Circle manifesto.

It states the scientific world-conception of the Vienna Circle, which is characterized "essentially by two features. First it is *empiricist and positivist*: there is knowledge only from experience [...]. Second, the scientific world-conception is marked by the application of a certain method, namely *logical analysis*." (*The Scientific Conception of the World. The Vienna Circle* in Sarkar, Sahotra, 1996, p. 331 - hereinafter *VC*).

Logical analysis is the method of clarification of philosophical problems; it makes an extensive use of the symbolic logic and distinguishes the Vienna Circle empiricism from earlier versions. The task of philosophy lies in the clarification - through the method of logical analysis - of problems and assertions.

Logical analysis shows that there are two different kinds of statements; one kind includes statements reducible to simpler statements about the empirically given; the other kind includes statements which cannot be reduced to statements about experience and thus they are devoid of meaning. Metaphysical statements belong to this second kind and therefore they are meaningless. Hence many philosophical problems are rejected as pseudo-problems which arise from logical mistakes, while others are re-interpreted as empirical statements and thus becomes the subject of scientific inquiries.

One source of the logical mistakes that are at the origins of metaphysics is the ambiguity of natural language. "Ordinary language for instance uses the same part of speech, the substantive, for things ('apple') as well as for qualities ('hardness'), relations ('friendship'), and processes ('sleep'); therefore it misleads one into a thing-like conception of functional concepts" (*VC* p. 329). Another source of mistakes is "the notion that *thinking* can either lead to knowledge out of its own resources without using any empirical material, or at least arrive at new contents by an inference from given states of affair" (*VC* p. 330). The latter notion is typical in Kantian philosophy, according to which there are synthetic statements a priori that expand knowledge without using the experience. Synthetic knowledge a priori is rejected by the Vienna Circle. Mathematics, which at a first sight seems an example of necessarily valid synthetic knowledge derived from pure reason alone, has instead a tautological character, that is its statements are analytical statements, thus very different from Kantian synthetic statements. The only two kinds of statements accepted by the Vienna Circle are synthetic statements a posteriori (i.e. scientific statements) and analytic statements a priori (i.e. logical and mathematical statements).

However, the persistence of metaphysics is connected not only with logical mistakes but also with

"social and economical struggles" (*VC* p. 339). Metaphysics and theology are allied to traditional social forms, while the group of people who "faces modern times, rejects these views and takes its stand on the ground of empirical sciences" (*VC* p. 339). Thus the struggle between metaphysics and scientific world-conception is not only a struggle between different kinds of philosophies, but it is also - and perhaps primarily - a struggle between different political, social and economical attitudes. Of course, as the manifesto itself acknowledged, "not every adherent of the scientific world-conception will be a fighter" (*VC* p. 339). Many historians of the Vienna Circle see in the latter sentence an implicit reference to a contrast between the so called *left wing* of the Vienna Circle, mainly represented by Neurath and Carnap, and Moritz Schlick. The aim of the left wing was to facilitate the penetration of the scientific world-conception in "the forms of personal and public life, in education, upbringing, architecture, and the shaping of economic and social life" (*VC* p. 339-340). On the contrary, Schlick was primarily interested in the theoretical study of science and philosophy. Perhaps the sentence "Some, glad of solitude, will lead a withdrawn existence on the icy slopes of logic" (*VC* p. 339) is an ironic reference to Schlick.

#### 4 Unified Science.

The final goal pursued by the Vienna Circle was unified science, that is the construction of a 'constitutive system' in which every legitimate statement is reduced to the concepts of lower level which refer directly to the given experience. "The endeavour is to link and harmonise the achievements of individual investigators in their various fields of science" (*VC* p. 328). From this aim follows the search for clarity, neatness, intersubjectivity, and for a neutral symbolic language that eliminates the problems arising from the ambiguity of natural language. The Vienna Circle published a collection, called *Einheitswissenschaft (Unified science)*, edit by Carnap, Frank, Hahn, Neurath, Joergensen (after Hahn's death) and Morris (from 1938), whose aim was to present an unified vision of science. After the publication in Europe of seven monographs from 1933 to 1939, the collection was dismissed, because of the problems arising from the World War II. In 1938 a new series of publications started in USA. It was the International Encyclopedia of Unified Science, an ambitious project never completed devoted to unified science. Only the first section *Foundations of the Unity of Sciences* was published; it contains two volumes for a total of twenty monographs published from 1938 to 1969. As remembered by Rudolf Carnap and Charles Morris in the *Preface* to the 1969 edition of the International Encyclopedia of Unified Science:

The *Encyclopedia* was in origin the idea of Otto Neurath. It was meant as a manifestation of the unity of science movement [...] Original plans for the *Encyclopedia* were ambitious. In addition to the two introductory volumes, there was to be a section on the methodology of the sciences, one on the existing state of the unification of sciences, and possibly a section on the application of the sciences. It was planned that the work in its entirety would comprise about twenty-six volumes (260 monographs) (*Foundations of the Unity of Sciences*, vol. 1, The University of Chicago Press, 1969, p. vii).

The well known Kuhn's work, *The Structure of Scientific Revolutions*, was published in this Encyclopedia in 1962, as the number two in the second volume.

#### 5 Congresses and publications.

Vienna Circle was very active in advertising the new philosophical ideas. Several congresses on epistemology and philosophy of science were organized, with the help of the Berlin Circle. There were some preparatory congresses: Prague (1929), Königsberg (1930), Prague (1934) and then the

first congress on scientific philosophy held in Paris (1935), followed by congresses in Copenhagen (1936), Paris (1937), Cambridge, UK (1938), Cambridge, Mass. (1939). The Königsberg congress (1930) was very important, for Gödel announced that he has proved the completeness of first order logic and the incompleteness of formal arithmetic. Another very interesting congress was the one held in Copenhagen (1936), which was dedicated to quantum physics and causality.

Between 1928 and 1937, the Vienna Circle published ten books in a collection named *Schriften zur wissenschaftlichen Weltauffassung (Monographs on the Scientific World-Conception)*, edited by Schlick and Frank. Karl Raimund Popper's book *Logik der Forschung* was published in this collection. Seven works were published in another collection, called *Einheitswissenschaft (Unified Science)*. In 1930 Carnap and Reichenbach undertook the editorship of the journal *Erkenntnis*, which was published between 1930 and 1940 (from 1939 the editors were Neurath, Carnap and Morris).

The following is the list of works published in the two collections edit by the Vienna Circle.

In the series *Schriften zur wissenschaftlichen Weltauffassung (Monographs on the Scientific World-Conception)*, edit by Schlick and Frank:

- R. von Mises, *Wahrscheinlichkeit, Statistik und Wahrheit*, 1928 (*Probability, Statistics, and Truth*, New York : Macmillan company, 1939)
- R. Carnap, *Abriss der Logistik*, 1929
- M. Schlick, *Fragen der Ethik*, 1930 (*Problems of Ethics*, New York : Prentice-Hall, 1939)
- O. Neurath, *Empirische Soziologie*, 1931
- P. Frank, *Das Kausalgesetz und seine Grenzen*, 1932 (*The Law of Causality and its Limits*, Dordrecht ; Boston : Kluwer, 1997)
- O. Kant, *Zur Biologie der Ethik*, 1932
- R. Carnap, *Logische Syntax der Sprache*, 1934 (*The Logical Syntax of Language*, New York : Humanities, 1937)
- K. R. Popper, *Logik der Forschung*, 1934 (*The Logic of Scientific Discovery*, New York : Basic Books, 1959)
- J. Schächter, *Prolegomena zu einer kritischen Grammatik*, 1935 (*Prolegomena to a Critical Grammar*, Dordrecht ; Boston : D. Reidel Pub. Co., 1973)
- V. Kraft, *Die Grundlagen einer wissenschaftliche Wertlehre*, 1937 (*Foundations for a Scientific Analysis of Value*, Dordrecht ; Boston : D. Reidel Pub. Co., 1981)

In the series *Einheitswissenschaft (Unified Science)*, edit by Carnap, Frank, Hahn, Neurath, Joergensen (after Hahn's death), Morris (from 1938) [these works are translated in *Unified Science: The Vienna Circle Monograph Series Originally Edited by Otto Neurath*, Kluwer, 1987]:

- H. Hahn, *Logik, Mathematik und Naturerkennen*, 1933
- O. Neurath, *Einheitswissenschaft und Psychologie*, 1933
- R. Carnap, *Die Aufgabe der Wissenschaftlogik*, 1934
- P. Frank, *Das Ende der mechanistischen Physik*, 1935
- O. Neurath, *Was bedeutet rationale Wirtschaftsbetrachtung*, 1935
- O. Neurath, E. Brunswik, C. Hull, G. Mannoury, J. Woodger, *Zur Enzyklopädie der Einheitswissenschaft. Vorträge*, 1938
- R. von Mises, *Ernst Mach und die empiristische Wissenschaftsauffassung*, 1939

Monographs, arranged in chronological order, published in the *International Encyclopedia of Unified Science*:

- O. Neurath, N. Bohr, J. Dewey, B. Russell, R. Carnap, C. Morris, *Encyclopedia and unified science*, 1938, vol.1 n.1
- C. Morris, *Foundations of the theory of signs*, 1938, vol.1 n.2



- V. Lenzen, *Procedures of empirical sciences*, 1938, vol.1 n.5
- R. Carnap, *Foundations of logic and mathematics*, 1939, vol.1 n.3
- L. Bloomfield, *Linguistic aspects of science*, 1939, vol.1 n.4
- E. Nagel, *Principles of the theory of probability*, 1939, vol.1 n.6
- J. Dewey, *Theory of valuation*, 1939, vol.2 n.4
- G. De Santillana and E. Zilsel, *The development of rationalism and empiricism*, 1941, vol.2 n.8
- O. Neurath, *Foundations of social sciences*, 1944, vol.2 n.1
- J. Woodger, *The technique of theory construction*, 1949, vol.2 n.5
- P. Frank, *Foundations of physics*, 1946, vol.1 n.7
- E. Frinlay-Freundlich, *Cosmology*, 1951, vol.1 n.8
- J. Joergensen, *The development of logical empiricism*, 1951, vol.2 n.9
- E. Brunswik, *The conceptual framework of psychology*, 1952, vol.1 n.10
- C. Hempel, *Fundamentals of concept formation in empirical science*, 1952, vol.2 n.7
- F. Mainx, *Foundations of biology*, 1955, vol.1 n.9
- A. Edel, *Science and the structure of ethics*, 1961, vol.2 n.3
- T. Kuhn, *The structure of scientific revolutions*, 1962, vol.2 n.2
- G. Tintner, *Methodology of mathematical economics and econometrics*, 1968, vol.2 n.6
- H. Feigl and C. Morris, *Bibliography and index*, 1969, vol.2 n.10

## 6 Quoted works.

- *Foundations of the Unity of Sciences*, vol. 1, Chicago : The University of Chicago Press, 1969
- Uebel, Thomas, 'On the Austrian Roots of Logical Empiricism' in *Logical Empiricism - Historical and contemporary Perspectives*, ed. Paolo Parrini, Wesley C. Salmon, Merrilee H. Salmon, Pittsburgh : University of Pittsburgh Press, 2003, pp. 76-93
- *Wissenschaftliche Weltauffassung. Der Wiener Kreis*, 1929. English translation *The Scientific Conception of the World. The Vienna Circle* in Sarkar, Sahotra, ed., *The Emergence of Logical Empiricism: from 1900 to the Vienna Circle*, New York : Garland Publishing, 1996, pp. 321-340

Mauro Murzi  
[mauro@murzim.net](mailto:mauro@murzim.net)

Last revision: December 13, 2005