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## WORKING PAPER SERIES

**A historical reconstruction of the connections between the Viennese neopositivists and the American pragmatists: economic theory in the project for the *International Encyclopaedia of Unified Science***

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**Abstract**

Persuaded by the fact that the philosophical debate in Vienna during the 1930s deeply influenced the subsequent American developments of economic theory, my purpose is to reconstruct, from a historical and theoretical point of view, how Austrian interests in economics (which spread in the interwar period) moved to the USA, and what the subsequent developments were. From a historical point of view, I shall focus on the genesis of the *International Encyclopaedia of Unified Science* promoted by philosophers belonging to the Vienna Circle (Otto Neurath, Rudolph Carnap and Philipp Frank) and American pragmatists (John Dewey and, above all, Charles Morris) between 1938 and 1969. From a theoretical point of view, I shall focus on the development of economic theory within this project, which was regarded as the most important outcome of logical positivism or new empiricism, this being the common philosophical outlook that they shared.

The aim of this paper is to show how the original meaning of economics (as formulated by Neurath) within the Vienna Circle was changed in its transition from Vienna to the USA (when the *International Encyclopaedia* was organized) and was finally radically transformed in the American context during the following decades.

**JEL Classification: B20; B25; B40; B41**

**Keywords: logical positivism, mathematical economics, Viennese economic theory, dissemination of ideas**

**Introduction**

As well known, after the *Anschluss* (1938) many Austrian scholars moved to the USA. There is quite a large body of literature on the topic. E. Craver (1986) claimed that “the most productive” immigrants were those who adapted well to the American tradition and mixed their contributions to American economics; K. Vaughn (1994) described the migration of the economists of the Austrian school; E. Timms and J. Hughes (2003) edited a book on the intellectual migration of Viennese scholars to the English-speaking world (including the UK); M. Rutherford (2004) described the relation between Columbia University and the

"University in Exile" (later the Graduate Faculty for Political and Social Science of the New School), founded to accommodate the exiled German scholars.

Among them were scholars belonging to two of the main scientific circles of the Viennese interwar period: the Vienna Circle (founded in 1922 by Moritz Schlick) and the Mathematical Colloquium (founded by Karl Menger in 1928). It is possible to speak of the "exiled Vienna Circle" (Feigl 1969; Stadler 2001; Richardson and Uebel 2007), and hence it is possible to regard the close relationship between Menger and other members of the Colloquium as "the exiled Mathematical Colloquium" (Golland and Sigmund 2000).

During the 1930s the philosophers of the Vienna Circle pursued the ideal of a unified science, *Einheitswissenschaft*, as one of the paramount aims of their new empiricist approach. According to Neurath (its first promoter), *Einheitswissenschaft* was not a sort of "super-science" able to legislate to the specific science; it had to be regarded as a tool able to unify scientific language, in order to avoid the many so-called metaphysical questions that still persisted in some sciences. In the 1930s, American philosophers like Charles W. Morris emphasized the link between the Viennese new empiricism (or logical positivism) and American pragmatism.

Neurath, Carnap and Morris jointly organized the project for the *International Encyclopaedia of Unified Science*, which was presented at the International Congresses for the Unity of Science organized between 1934 and 1939 in Europe and the USA. Like other encyclopaedias, the *International Encyclopaedia* was to be directed at the largest number of readers. Unlike other encyclopaedias, however, where topics followed an alphabetical order without any specific connections among them, and thus made it difficult to establish connections among sciences, the *International Encyclopaedia's* aim was to provide a logical interrelation among sciences: each volume would deal with a specific science with a view to showing its degree of scientific empiricism. The volume on economics appeared in 1968, thirty years after the launching of the project, and twenty years after the definitive transfer of the entire project to the USA.

In its final stage, economic theory within the *International Encyclopaedia* was denoted as econometrics and mathematical economics, which became the mainstream of the discipline after the Second World War. This was very different from the original intention of Neurath, who had introduced economics into the Viennese philosophical project of building a "unified science". Talking about the relationship between mathematical economics and the Vienna Circle, the figure of Karl Menger (the mathematician son of the founder of the Austrian school of economics) was significant, because in his Viennese Mathematical Colloquium,

mathematical economics was developed by Menger himself, Abraham Wald, Karl Schlesinger and John von Neumann.<sup>1</sup> Menger was very close to the Vienna Circle, but he always refused to be involved in the *Encyclopaedia*, both at the beginning of the project and thereafter during its American phase. Menger and the other members of his Mathematical *Colloquium* agreed that it was necessary to apply the Hilbertian programme for the axiomatization of the social sciences, including economics: their shared philosophical framework (which led them to mathematical economics) was quite distant from the new empiricist point of view of the Vienna Circle.<sup>2</sup> Moreover, they were highly critical of the idea of a unified science. These were the main reasons that kept them distant from the project for the *International Encyclopaedia*, even though Neurath and Morris tried to persuade Menger to join the project on several occasions.

Paradoxically, the economic theory in the *International Encyclopaedia* at its final stage (1968) was closer to mathematical economics *à la Menger* than to political economy *à la Neurath*.

The aim of this paper is to examine the role of economics within the neo-positivist philosophical framework that migrated from Vienna to the USA. Because economics was included first in the Vienna Circle's philosophy and thereafter in the so-called "unified science" (*Einheitswissenschaft*), it is important to understand what kind of economics was introduced by Otto Neurath into the Vienna Circle's programme at the beginning of the *International Encyclopaedia* project, and what kind of economics was envisaged when the project was definitively taken up by the American board and when the volume on economic theory, written by Gerhard Tintner, finally appeared in 1968.

In order to follow the development of economics within the *International Encyclopaedia* project, I have drawn mainly on the archive of the Unity of Science Movement held at the Special Collections Research Center, Regenstein Library, University of Chicago. This forms a small part of Charles Morris' personal archive. The collection contains items from 1934 (the Prague congress) to 1968 (the year of publication of the last volume of the *Encyclopaedia*),

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<sup>1</sup> Karl Menger was a key figure in the history of the connections between mathematics and economics in the Viennese interwar period (Dawson and Sigmund 2006; Stadler 2001; Weintraub 1983; Punzo 1989 and 1991). Wald and von Neumann used new mathematical tools to solve the still open problems of general economic equilibrium.

<sup>2</sup> Contrary to what is commonly believed, there were differences of view within the Vienna Circle, and between the Circle and the Colloquium (Sigmund 2002; Stadler 2006, Becchio, 2008), and in the mid-1930s the distance between the Circle and the Colloquium became evident.

and it also includes the correspondence of the movement's members,<sup>3</sup> manuscripts, organizational materials and abstracts from the International Congresses, and documents related to the *International Encyclopaedia of Unified Science*.

The paper is structured as follows. There are three sections. The first deals with the antecedents of the *International Encyclopaedia* project (1922-29); the second is concerned with the preparation of the project between Vienna and the USA (1931-41); the third deals with the appearance of the volume on economics, which occurred when the *International Encyclopaedia* had been finally "Americanized". Each section is divided into two subsections dealing respectively with the historical context and developments of the creation of the *International Encyclopaedia* and with the specific place of economics in the project at that particular stage.

## **1. Economics in Vienna (1922-1929)**

### **1.1 Historical remarks: from the foundation of the Vienna Circle to the *Manifesto***

Between the end of the nineteenth century and the interwar period, Vienna was a city with a highly dynamic cultural life (Janik and Toulmin 1973). Many progressive intellectual circles developed during that period,<sup>4</sup> In 1922 Moritz Schlick founded a philosophical circle which took his name and later became better known as simply the Vienna Circle. This was a private group; its members shared the rejection of both idealism and neo-Kantianism that culminated in the advent of the new empiricism. The neo-empiricist paradigm (or logical empiricism) repudiated every statement not verifiable either logically or empirically: according to Schlick's theory of knowledge (Schlick 1918), the aim of this new scientific paradigm was to reject any kind of metaphysics in order to find a tool able to remove the heterogeneity between empirical observation and logical elaboration. All knowledge in every discipline had

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<sup>3</sup> Most notably Percy W. Bridgman, Rudolph Carnap, John Dewey, Herbert Feigl, Philipp Frank, Joergen Joergensen, Victor Lenzen, Charles W. Morris, Otto Neurath, Hans Reichenbach, Louis Rougier, and Bertrand Russell.

<sup>4</sup> They were discussion groups. Some of them were connected with the university, like the one founded by Hans Kelsen and the *Miseskreis* led by Ludwig von Mises (Kurrild-Kiltgaard 2003). Many others were private groups, like the *Geistkreis*, dealing with research in the social sciences, founded in 1921 by Hayek and Furth "who were dissatisfied with the character of Othmar Spann's doctoral seminar and wanted to create an independent and broader alternative" (Kurrild-Kiltgaard 2003, p. 48). Othmar Spann was professor of economics at the University of Vienna and later became one of the most influential theorists of Austrian fascism and of the corporative state. Among those most distant from the academic world were the socialist discussion groups and the psychoanalytical ones; the groups devoted to educational reforms, some literary circles (mainly influenced by Russian writers, Tolstoy in particular) and many philosophical groups, some oriented to historicism, some to Kantianism, many others to Kierkegaard and phenomenology (Menger 1994). One of the most striking characteristics of these circles was the active interaction among them.

to be verified in order to achieve the status of science. That was the main reason why many scholars working in several disciplines – not just philosophers like Schlick and Rudolph Carnap – joined the Circle (Hans Hahn and Kurt Reidmeister were mathematicians; Otto Neurath was an economist and a sociologist; Victor Kraft was a historian and Felix Kaufmann a lawyer). In 1927 Karl Menger joined the Vienna Circle on invitation by Hans Hahn, his old friend and mentor, and by Schlick and Carnap, who were very interested in his studies on curve theory (Menger 1994). In 1928 Menger organized his *Mathematical Colloquium* in collaboration with the Warsaw School. The *Colloquium* consisted of informal meetings held in the evenings with some of Menger's students and colleagues, among them Kurt Gödel Its topics were geometry, mathematics and logics, but the social sciences, especially economics and ethics, soon became themes of great interest to it.

In 1929, the *Manifesto* of the Vienna Circle, *Wissenschaftliche Weltauffassung: Der Wiener Kreis*, was printed and signed by Hans Hahn, Otto Neurath and Rudolph Carnap. The *Preface* explained the expression “the scientific conception of the world”: this was not a particular philosophy, but “a basic attitude [whose] goal [was] *unified science*. The endeavour is to link and harmonise the achievements of individual investigators in their various fields of science” (Neurath 1973, p. 306). The aim of the “scientific conception of the world” was to clarify the traditional problems of philosophy, “partly to unmask them as pseudo-problems and partly to transform them into empirical problems and thereby subject them to the judgement of experimental science” (Neurath 1973, p. 306). The proper method for this procedure was the *logical analysis* “that essentially distinguishes recent empiricism and positivism from the earlier version that was more biological-psychological in its orientation” (Neurath 1973, p. 306) and was able to reject any form of metaphysical residuals, such as intuition and apriorism, as sources of knowledge. As the *Manifesto* claimed: “in rejecting overt metaphysics and the concealed variety of apriorism, all adherents of the scientific world-conception are at one” (Neurath 1973, p. 308).

After the publication of the *Manifesto* the divergence between the philosophers of the Vienna Circle and the mathematicians of the Mathematical Colloquium grew increasingly wide.

## **1.2. Economics in Neurath's thought and in the *Manifesto***

Neurath described himself as a ‘social engineer’ who wanted to find a technical approach that would transform economic systems so as to improve the welfare of individuals, not by changing the objective possibilities of increasing a country's production and productivity, but by finding which institutions and political interventions could redistribute the conditions that

generated happiness for people in that country. He studied economic theory with a view to changing the social order on the basis of a rational model for the improvement of the lower classes (Soulez, 1996).<sup>5</sup> During the 1920s, Neurath propounded concrete models of socialized economic systems. He maintained in his writings that the traditional strong opposition between “abstract economic theory” and “concrete economics” (Neurath 2004, p.271) should be dropped in order to define economics as a science, and he set out his two main criticisms of the economics of his time. First, economics confused the analysis of human action – which assumed that human actions and patterns of behaviour are not consciously goal-directed – with the theory of choice motivation. According to Neurath, the motivations of human action should be treated as a “a separate question” (ibid, p. 276). If economic theory became independent from inquiry into the motivations for choice, it could resolve the controversy on the role of history and theory at the centre of *Methodenstreit*, whose echoes were still reverberating at that time. The second fault of economics was the “fallacy” of identifying the discipline as a whole with just one historical model (the monetary economy), which it “followed too closely” (ibid., p. 278). Economic theory borrowed from this model a theoretical and conceptual pattern which it considered to be general but which in fact was valid only for *that* particular historical model: “economic theory also followed too closely the example of monetary economics” (p. 278). The first step toward a scientific economics was the elimination of abstract concepts like “*homo oeconomicus*”.<sup>6</sup>

Neurath maintained that reconstructing economic science in order to remedy what he called “the lack of an adequate set of theoretical concepts” (Neurath 2004, p. 312) was functional to the radical change in the economic system that the war had demonstrated was possible. He was convinced that the aim of economic theory was to explain how the material conditions of life are formed by “transfers of goods” and to identify the conditions under which one state can be derived from the other. On formulating the notion of ‘life conditions’ Neurath had two goals in mind: to give a socio-theoretical explanation for the total life context and to model society in keeping with social planning. According to Neurath, this “lack of an adequate set of theoretical concepts was already sensed before the World War, but is felt even more clearly now that the conflict between the market economy and administrative economy becomes ever more

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<sup>5</sup> As a student of Böhm-Bawerk in Vienna and of Gustav Schmoller in Berlin, he was influenced by the Austrian school and by the historical school. He adopted an intermediate position in the long-standing debate on the *Methodenstreit*, which he considered had been superseded by a proper definition of the scientific status of economics (Leonard 1998).

<sup>6</sup> Neurath criticized the concept of *homo oeconomicus* and he considered the economy-in-kind to be an approach under which the effects of the existing money economy order could be compared with others (Nemeth 1996).

evident”. Neurath was deeply interested in investigating concrete alternatives to liberal society. He maintained that it was necessary “to create a structure for an economic theory that is able in principle to provide equal theoretical treatment to all possible forms of economic activity.” (ibid, p. 312). This was only possible by using an economy-in-kind which derived, not from the concept of economic efficiency, but from that of “wealth”, i.e. “what one produces and consumes in the widest sense” (ibid, p. 340). This concept “is linked to all those scholars who simultaneously treat different forms of economy and to all those who as utopians treat of possible institutions” (ibid).

Neurath included economics and social science among the disciplines to be treated by the new empiricism (the philosophical outlook of the Vienna Circle) and in the *Manifesto*. The *Manifesto* (1929) treated economics, together with history, as a social science and placed it among the group of five sciences (arithmetic, physics, geometry, biology and psychology, and the social sciences) that were to become the subject-matter of the new positivist philosophy after the “elimination of metaphysical admixtures” still present in them. Neurath defined the scientific features of ‘history’ and ‘political economy’ in his *Empirical Sociology* (1931), where he maintained that “they set closer together and merged into a single science”, namely ‘sociology’. Neurath thus bridged the gap between history and economic theory about which he had written many years before, claiming that Marxism had demonstrated that the separation between economics and history no longer made sense, “especially in Western Europe” (Neurath 1973, p. 346). In this paper he described the passage from a magical phase of science to the so-called ‘unified science’, *Einheitswissenschaft*, on which Neurath had worked throughout the 1930s.

## **2. From Vienna to USA between Neurath and Morris (1931-1941)**

### **2.1 Historical remarks: the internationalization of logical positivism through the project of unifying science**

Between 1928 and 1937, the Vienna Circle published ten books in a collection entitled *Schriften zur wissenschaftlichen Weltauffassung (Monographs on the Scientific World-Conception)*, edited by Schlick and Frank (Popper’s book *Logik der Forschung* was published in this collection). Seven works were published in another collection, entitled *Einheitswissenschaft (Unified Science)*, edited by Carnap, Frank, Hahn, Neurath, Joergensen



(after Hahn's death in 1934).<sup>7</sup> Contacts between the Vienna Circle and the American pragmatists transformed the *Unified Science Collection* into the *International Encyclopaedia of Unified Science*. In the meantime, the Vienna Circle's philosophical outlook began to circulate abroad: in Berlin (thanks to contacts with Reichenbach) and in the USA as well, while Menger's Mathematical Colloquium became close to Polish mathematicians and logicians like Tarski. The first official contact between Viennese philosophers of Schlick's circle and American philosophers came about in 1931, when Herbert Feigl and Albert Blumberg published, in the *Journal of Philosophy*, "Logical positivism: A New Movement in European Philosophy". This article made the first use of the expression "logical positivism" to denote the Viennese philosophical outlook. Feigl was one of the most prominent students of Schlick and later one of the most active members of the Vienna Circle. In 1930 he obtained a fellowship for a visiting position in USA (Harvard), where he co-authored the above-mentioned paper with Albert Blumberg, an American philosopher, who had received his PhD in Vienna under the supervision of Schlick and was teaching at The John Hopkins University. Feigl and Blumberg introduced Viennese logical positivism to the American audience. They specified that the aim of this new philosophical movement was to achieve "a unified theory of knowledge in which neither logical nor empirical factors are neglected" (Feigl and Blumberg 1931, p 282), which rejected any form of Kantianism, and which was intended to be a synthesis of rationalism and empiricism. American neo-pragmatists like Charles W. Morris emphasized the link between Viennese new empiricism and American pragmatism.

In the same year (1931) Charles Morris met Karl Menger at the Rice Institute in Texas (during the spring semester), where Menger was lecturing as visiting professor and Morris worked at the Department of Philosophy. According to Menger's reminiscences, they talked "a great deal about the Vienna Circle" (Menger 2009).

As we shall see, Menger was never interested in the project for a *unified science*, unlike Morris, who attended the first congress on unifying sciences held in 1934 in Prague. As Karl Menger's correspondence reveals, in July 1934, before Morris attended the congress in

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<sup>7</sup> It included: Hans Hahn, *Logik, Mathematik und Naturerkennen*, 1933 ;Otto Neurath, *Einheitswissenschaft und Psychologie*, 1933 ;Rudolf Carnap, *Die Aufgabe der Wissenschaftslogik*, 1934;Philipp Frank, *Das Ende der mechanistischen Physik*, 1935; Otto Neurath, *Was bedeutet rationale Wirtschaftsbetrachtung*, 1935; Otto Neurath, E. Brunswik, C. Hull, G. Mannoury J. Woodger, *Zur Enzyklopädie der Einheitswissenschaft*. Vorträge, 1938; Richard von Mises, *Ernst Mach und die empiristische Wissenschaftsauffassung*, 1939. These works are translated in *Unified Science: The Vienna Circle Monograph Series Originally Edited by Otto Neurath*, Kluwer, 1987.

Prague, he spent some weeks in Vienna “to make connection with members of the Wiener Kreis”.<sup>8</sup>

The decision to launch the *International Encyclopaedia* project was taken in August 1934 in Prague, where numerous Viennese, German and American philosophers had gathered for a philosophical congress (Stadler 2001). After the Prague congress, philosophers of the Vienna Circle and American pragmatists organized six “International Congresses for the Unity of Science”: Paris (1935 and 1937), Copenhagen (1936), Cambridge, UK (1938), and after the outbreak of the Second World War, in the USA, at Cambridge, Massachusetts (1939), and in Chicago (1941). The so-called Unity of Science Movement was formed as a result of these international meetings,<sup>9</sup> and the project for the *International Encyclopaedia of Unified Science* began (Morris 1960). The two promoters of the project were Otto Neurath in Europe (he moved from Vienna to The Hague in 1935 and, after the Nazi occupation of Holland in 1941, he escaped to England) and Charles Morris in Chicago. From 1938 to 1969 twenty books (divided into two volumes) of the *Encyclopaedia* appeared.<sup>10</sup> In a letter to Neurath (June 20, 1937), Morris rejected the title proposed by Neurath (*Symposium of the New Encyclopaedists*) because he found it both too literary and too pretentious. He proposed “simply *Unity of Science Movement*”. They finally agreed on the definitive title: “The title is now definite: International Encyclopaedia of Unified Science”.

Charles Morris’s role became fundamental in 1934, when after the advent of the fascist Austrian government, difficult times began for Jewish scholars in particular, and for those not

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<sup>8</sup> Letter of 5 July 1934 from Charles Morris to Karl Menger, Karl Menger papers, Perkins Library, Duke University.

<sup>9</sup> The special issue of *Philosophy and Phenomenological Research* Vol. 6, No. 4, Jun., 1946 is entirely devoted to the Unity of Science Movement.

<sup>10</sup> Publications are arranged in chronological order. O. Neurath, N. Bohr, J. Dewey, B. Russell, R. Carnap, C. Morris, *Encyclopaedia 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.

linked with the regime in general. It was Morris who financed the organization of the entire *Encyclopaedia* project. In a letter of 28 January 1935 he requested W. Weaver (Rockefeller Foundation) to furnish financial support for the unified science movement. In this letter, Morris described the movement thus:

“I represent an international group of scientists and logicians interested in the unification of science meaning by that term not a synthesis of factual results but the analysis and systematization of the language of science. The enterprise is in no sense philosophical, if by philosophy one means more than work on the foundations of science and completion of the structure of science. (...) The three purposes of this group are 1) to unite scientists and logicians interested in the unification of the language, and secondarily the factual results of science, 2) to publish ultimately an encyclopaedia of the sciences, written for the first time in terms of a unified conceptual apparatus, 3) to act to some extent as a unified center against the anti-scientific tendencies which threaten to limit or destroy the slowly acquired scientific habit of mind and technique”<sup>11</sup>.

The correspondence between Morris and Neurath illustrates the genesis of the *Encyclopaedia*. This was intended to be a new research project based on the general aims described in the above-quoted letter and not simply an extension of the Vienna Circle’s philosophical positions. As Morris pointed out in a letter of 11 November 1936 to Neurath: “I am interested in the Unity of Science movement as such, and not in any special group such as the Wiener Kreis, the pragmatists, or any other”.<sup>12</sup>

Their correspondence also reveals the efforts made to involve European and American scholars in the project. In a letter of 30 March 1936, Morris announced to Neurath that the University of Chicago Press had agreed to publish the *Encyclopaedia*. Hence the next step was to set up “special committees” for the various disciplines: Morris suggested Enriques for the history of science, Łukasiewicz for the history of logic, Carnap for logic, and Reichenbach for the methodology of logic.<sup>13</sup> In a letter of 11 May 1936, as contributors Neurath gave Morris the names of Mannoury, Feigl, Dubislaw, Karl Menger, Radacovic, Waismann, Zilsel, and Popper and suggested to Morris that “it would be useful to use Ernest Nagel as

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<sup>11</sup> Charles Morris Correspondence, Guide to the Unity of Science Movement Records, 1934-1968, Regenstein Library, University of Chicago: henceforth Charles Morris correspondence, Regenstein Library, University of Chicago.

<sup>12</sup> Charles Morris correspondence, Regenstein Library, University of Chicago.

<sup>13</sup> Furthermore Morris promised Neurath that he would organize a congress in the USA in 1938 or 1939 (although he pointed out that 1939 was better than 1938 because in the USA the movement was “just beginning to grow”): Charles Morris correspondence, Regenstein Library, University of Chicago. In fact, the congress was held in 1939 at Cambridge (Mass).

collaborator and other young Americans”. In the fall of 1936 Neurath travelled to Chicago in order to organize every detail for the *Encyclopaedia* with Morris and Carnap. In a letter of 10 October 1936 about Neurath’s itinerary and the people whom he was expected to meet, Morris gave a list of persons on the faculty interested in the *Encyclopaedia* project, and he invited Neurath to regard Henry Schutz, the economist, as someone that they “should consider in making assignments for the *Encyclopaedia*”. Neurath included Menger in the initial project of the *Encyclopaedia*: he asked him to write “mathematics” (even if Neurath himself wrote to Morris that “maybe for mathematics it is better Gödel than Menger” (November 2, 1936)). Menger declined his invitation,<sup>14</sup> as well as refusing to become a member of the Advisory Commission for the *Encyclopaedia*.<sup>15</sup>

But a month later, in a letter to Bean (November 18, 1936), Morris listed the planned 16 pamphlets making up the two volumes *Foundations of the Unity of Science* (part of the larger *International Encyclopaedia*) and economics was not included.<sup>16</sup>

In the meantime, in Vienna, it was impossible to continue publishing *Erkenntnis*, the journal of the Vienna Circle. Many scholars belonging to the circle had moved to the United States or to England, where the Circle’s ideas became increasingly widespread; and others had died (Schlick was killed in 1936, Schlesinger committed suicide in the same year). *Erkenntnis* was replaced by a new journal, published in Chicago, which Morris suggested to Neurath should be called “Journal of Unified Science”<sup>17</sup>. In 1938 the *Anschluss* definitively destroyed the Viennese milieu. By the late 1930s the entire Vienna Circle had resettled outside Austria.

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<sup>14</sup> Neurath communicated Menger’s decision in a letter of 12 March 1937 to Morris and Carnap: “Menger is concentrated in special problems of mathematics and not in the position to write about Mathematics. He suggested Waismann. I agree with him to invite Waismann, but as collaborator for the other volumes not for this first group of pamphlets. I think we shall invite Tarski. Please tell me you both what you suggest. It was I think our common opinion to invite Tarski if Menger would be not in the position to make this pamphlet ... [he] could use the title “Mathematics and logic”. I understand your hesitations in the case that Menger or Gödel would make this pamphlet”.

<sup>15</sup> Otto Neurath to Karl Menger (19 February 1937 and 14 March 1937), Karl Menger Papers, Perkins Library, Duke University.

<sup>16</sup> Morris wrote: “The pamphlets [will] be as follows: 1. The Unity of Science (Neurath, Carnap, Morris, Dewy, Russell, Rougier); 2. Theory of Signs (Morris); 3. Logical Analysis of Science (Carnap); 4. General Linguistic (Andrade); Mathematics (Gödel); 6. Physics (Frank); 7. Cosmology (Reichenbach); 8. Biology (Woodger); 9. Biology and Physics (Reshevsky, Leconte du Noay); 10. Psychology (Tolman); 11. Sociology (Neurath); 12. The History of Science (Enriques); 13. The History of Logic (Łukasiewicz); 14. The History of Empiricism (Rougier); 15. Logical Empiricism (Joergensen); 16. General Index” and four additional volumes including “a volume giving short papers on logical analysis in various fields of value (esthetics, ethics, education etc.)”.

<sup>17</sup> Letter from Morris to Neurath (31 May 1938) and letter from Morris to Donald Bean, head of the Chicago University Press (20 November 1938). See also Neurath to Morris (5 April 1940): “the transformation of *Erkenntnis* into the *Journal of Unified Science* is completed”, Charles Morris correspondence, Regenstein Library, University of Chicago..

In 1939 Morris and Carnap started organizing the “Foundation of the Unity of Science”. Although there was strong initial interest in the movement among philosophers, the activities of the Unity of Science Movement were severely restricted by the outbreak of the Second World War: the *Journal* was suspended in 1940.<sup>18</sup>

The last congress was held in 1941 at the University of Chicago. Morris was the host and in his welcoming speech he declared: “the term *unity of science* serves as a slogan for the organization. The unity of science movement simply provides an occasion for co-operative attack upon all problems which concern the scientific enterprise as a whole. The nature of this enterprise, the methods science employs, the history of science, the sociology of science, the interrelations of the terms and the laws of the special sciences. There is no set of dogma which one must believe, no conclusion into which the results of cooperative endeavour must be pressed, no insistence upon unity. No one can, then, speak officially for the unity of science movement”. Thereafter, the Unity of Science Movement, and the *International Encyclopaedia* project as well, moved to Chicago, where Morris and Carnap were living and working. Furthermore, during the Second World War any organization of the movement as well as of the *Encyclopaedia* was interrupted for a long period; Neurath died suddenly at the end of 1945.

## **2.2 The place of economics at the early stage of the *International Encyclopaedia of Unified Science***

As we have seen, economics was included in the *Manifesto*, but there was no place for it in the seven volumes of the *Unified Science Collection*. Things seemed to change when the movement became international. At the congress held in Paris in 1935, Robert Gibrat presented a paper on economics, which he described as a complex science that must be expressed in mathematical terms, and in particular by econometric tools able to analyze statistical data (Gibrat, 1936). The importance of statistics for economic analysis had always been a constant of Neurath’s thought: for him, statistics was the sole tool required by calculation in kind (Neurath 2004, p. 327).

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<sup>18</sup> In a letter from Morris to Carnap, Reichenbach, Frank and Neurath (29 September 1941). Morris stated in regard to the *Journal* that he was carrying on a personal struggle to find funds so that it could be published in Chicago, in spite of the fact that Neurath would have liked it to be published in the UK (by Blackwell): Charles Morris correspondence, Regenstein Library, University of Chicago.

Neurath undoubtedly had the firm intention of including economics in the *Einheitswissenschaft*. He presented a paper at the fifth International Congress for the Unity of Science (Cambridge, MA, 1939) in which he stressed the need to include economics in the unified science, although he acknowledged that it could be difficult. Neurath discussed two kinds of economics: one dealing with market, money, consumption, production (where it is possible to create models in order to show real economic events); the other dealing with “the combination of different levels of lives” (Neurath 1973, 211).

In spite of Neurath’s effort to include economics and social sciences, from the second half of the 1930s until his death (1945), economics seems to have been excluded from the entire project. In a letter of 23 April 1941, M. K. Hubbert discouraged Morris from including economics in the project of unifying science, comparing it to astrology and alchemy. In the same year (1941) *The development of rationalism and empiricism* appeared as the eight number of the second volume of the *International encyclopaedia*, written by G. De Santillana and E. Zilsel. Zilsel wrote the part dealing with the social sciences. He was a Viennese scholar, member of the Gomperz Circle (which included Popper), another Viennese philosophical circle closely in contact with the Vienna Circle. In regard to economics, Zilsel claimed that it had a philosophical source (it was initially “political economy” as a branch of moral philosophy) but it spread from the practical needs of the economy as capitalism developed. According to Zilsel, political economy never went through the animistic stage (like most other science, i.e. physics) and its aims from the outset had been to control and predict economic processes in order to find casual explanations of economic phenomena useful for formulating economic laws. Moreover, in the nineteenth century, statistical methods had been added and had proved to be highly successful. Zilsel also claimed that “rational deduction and mathematics do play a large part in certain economic theories”. Although political economy might be the only empirical science in which, for the reasons mentioned above, the empirical elements are likely to be impaired by an excess of rational deduction rather than by pre-scientific tradition, it is too often exposed to “selfish interests, political pressure, and wishful thinking than is the case in any other science”. Zilsel stressed that: “in political economy scientific agreements could be reached only on comparatively unimportant questions; in fact, there are separate schools which do not even recognize each other. Some of them cling to experience; the results of their inquiries are collections of material rather than theories in which facts are causally explained. Others deal with nothing but laws of economy; they investigate them by means of rational analysis of a few basic concepts and construct large deductive systems based upon scanty observations” (pp.832-

833). This was Zilsen's position, but as Neurath often remarked, each volume of the *International Encyclopaedia* was intended to be the official position of the groups as a whole ("the republic of scholars").

In 1941 there was the last international congress, which was held in Chicago: seven years after Gibrat's paper (1935), another one dealing with economics was presented. This was Oskar Lange's *The Foundation of Welfare Economics*, which a year later was published in *Econometrica* (Lange 1942). Lange described welfare economics in the following terms: "welfare economics can be divided into two parts: maximizing the vector  $u$  permits to increase the utility of one individual without diminishing the utility of anybody else ... [and] the setting up of a social value function  $W(u)$  which is maximized ... Neither the social valuations nor the utilities of the individuals need to be measurable; it is sufficient that they can be ordered". Although Lange presented his paper at the Chicago congress, he was never involved in the *International Encyclopaedia* project: no letter testifies to an interest on his part or to a request from Morris or Neurath to join. Furthermore, Lange's definition of welfare economics had nothing in common with Neurath's political economy: it was the antecedent of the social welfare economics later developed by Arrow, and it was very distant from Neurath's definition of economics as put forward in his volumes of the *Encyclopaedia*.

Neurath's main contribution to the *Encyclopaedia* appeared in the mid-1940s. This was "On foundations of social sciences" (Neurath [1944] 1969), in which he dealt very briefly with economics by again proposing the same form of economy-in-kind: "We may ask how we can compare the results of a society based on money reckoning with a society based on reckoning in kind ("economy in money" compared with "economy in kind"), i.e., how we can look at their efficiency in terms of living conditions. It may be that the result of such an analysis of a world society, based on reckoning in kind and not in money, would be less efficient in terms of living conditions" (ibid. p.13).

Summing up, despite Neurath's conviction that 'Logical Empiricism' should be applied to scientific issues including those of economics, during the ten years of the transition of the *International Encyclopaedia* from Vienna to USA, no place was allocated in it to economics.

### **3. The *International Encyclopaedia* after the Second World War (1946-1969)**

#### **3.1 Historical remarks: the Americanization of the project**

During the years of the Second World War, publication of the *International Encyclopaedia* as a whole was interrupted. Neurath died in 1945, and he never published a volume on economics and sociology in the *International Encyclopaedia*; Moreover.

At the end of the war, the project was resumed by Charles Morris, Rudolph Carnap (both in Chicago) and Philipp Frank, whose role grew increasingly important; the Unity of Science Movement planned to resume publication of the second volume of the *International Encyclopaedia*, which was to be concerned with the socio-humanistic sciences (Morris 1946), ethics in particular.

In 1947, the Institute for the Unity of Science was re-founded in Ithaca, (New York) by Carnap, Morris, Reichenbach, Frank and Milton Konvitz, with Frank as President. When Frank moved to Boston, the legal head office of the Institute followed him. Its purpose was “to encourage the integration of knowledge by scientific methods, to conduct research in the psychological and sociological backgrounds of science, to compile and publish bibliographies and other forms of literature with respect of the integration of scientific knowledge, to support the international movement for the Unity of Science and to serve as a centre for the continuation of the publications of the Unity of Science movement” (Frank 1947).<sup>19</sup>

In a letter of 24 May 1947, Frank informed Morris that the Rockefeller Foundation would finance the Institute for the Unity of Science. The aim of this Institute was to carry forward the Logical Empiricism started by Neurath and Carnap through publication of the *Encyclopaedia*; the aim of logical empiricism being to synthesize the sciences on purely scientific grounds. This synthesis could be applied to every science: “by the application of logico-empirical and socio-psychological analysis science will emerge from its isolation ... “hybrid fields” like “mathematical economics” are no longer isolated cells where some queer professors may enjoy their strange fancies, but by the application of logico-empirical and socio-psychological analysis these “cross-connections” become the roots of the new developments leading towards the integration of human knowledge and human behavior” (Frank 1947, p.166)

In a letter to Morris (12 August 1949), Frank wrote: “It would be very important if you could make some contributions concerning the relations of logical empiricism to the study of man, to paths of life, and similar subjects. We need just short articles which clear up some misunderstandings and emphasize the wider goals of logical empiricism in order to discourage the opinion that logical empiricism has only to do with the analysis of language”.

In another letter (November, 8 1949), Frank underlined that the main aim of the new Institute was “to prevent logical empiricism from becoming a narrow sector but rather a significant part of a wide movement in science and philosophy”. According to Frank, “to start the

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<sup>19</sup> The manifesto of this new movement was published in *Institute for the Unity of Science. From Minutes of Board of Regents, Synthese*, 6:3/4 (1947-1948) p.158.



international cooperation, we have to keep the European scientist informed about the work which is done in the USA". In this regard, Frank informed Morris about the agreement between himself and the editors of the international philosophical journal *Synthese*, published in Amsterdam, for the publication of "a special series of articles running in our communications to the history of logical empiricism and to its relations to other similar trends. Its main purpose ought to be to prevent logical empiricism from becoming a narrow sector but rather a significant part of a wide movement in science and philosophy".

Philipp Frank, like Neurath before him, tried to involve Menger in the activities of the new Institute. In 1952 Frank sent Menger a letter in which he asked him to write "a small book on the philosophical interpretations of mathematics" within a series of books on the philosophical foundations and interpretations of the different sciences; Frank explained to Menger that: "the books should be on such a level that they are understandable for all people with an average college education and a certain interest in science and philosophy"<sup>20</sup>. Menger again declined.

To be noted is that the letter was written on a card of the "Institute for the Unity of Science", and inspection of the list of board members shows that it included all the members of the old Vienna Circle who had moved to the USA: Frank, the president (Harvard), Morris (Chicago), Nagel (Columbia), Carnap (Chicago), Feigl (Minnesota), Hempel (Yale), Reichenbach (UCLA). This testifies to the evident re-establishment of relationships among the exiled Viennese scientists in the United States after the Second World War.

Many years passed before the Board of the Unity of Science Movement made up its mind to schedule a volume on economics. In a letter of June 21, 1960 Morris wrote to Carnap that it was time to find someone able to write the volume of the *Encyclopaedia* dealing with economics. He was thinking of involving Tinberger (at that time teaching at The Hague), asking him for a book entitled "Mathematical Tools in Economics".

Three years later, on Carnap's suggestion, Morris proposed the volume on economics to Gehrard Tintner, who had been a student of Carnap. In truth, some years previously Tintner himself had asked Carnap to write a monograph for inclusion in the *International Encyclopaedia*, but at that time the Board had hoped to obtain a monograph in the humanities from Meyer Shapiro (Columbia). Because by 1963 Shapiro had not delivered any of the material that he had promised, Morris asked Tintner if he was still in a position to consider writing the monograph he had proposed. Tintner agreed to write *Methodology of*

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<sup>20</sup> Philipp Frank to Karl Menger, 4 June 1952, in Karl Menger Papers, Perkins Library, Duke University.

*Mathematical Economics*, as he himself stated in a letter to Carnap (November 27, 1963). The genesis of Tintner's volume was rather difficult: there were three versions. The first manuscript was refereed by Morris. In a letter to A. Richter, assistant director of the University of Chicago Press (October 6, 1965), Morris underlined that, although "portions of the Tintner's monograph will not be followed on detail by the general reader", the series is too weak in the social sciences area; hence "it is important to have a monograph which strengthens this area, and especially one which illustrates the combination of the rational and empirical factors in science which the *Encyclopaedia* as a whole basically stresses"

In a letter of 6 June 1966, Carnap expressed his disappointment to Morris about Tintner's second version of his manuscript: "nevertheless, for readers who have some knowledge of economics and statistics, the monograph will be a useful summary of the field, and helpful in giving further references ... although far from really satisfactory, still the best we can get from him; and there will be some readers who can benefit from it". Finally, in 1968, G. Tintner published *Methodology of Mathematical Economics and Econometrics*.

In the meantime, in 1965 Morris had succeeded Frank as President of the Institute for the Unity of Science. In the same year *Synthese* was discontinued, and it was replaced by a new journal, *Methodology and Science*, brought out by another publisher. In 1969 *Index and Bibliography*, edited by Feigl and Morris, the final volume of the *International Encyclopaedia* appeared, and the project was definitively concluded.<sup>21</sup> In the end, only the first two of the planned 200 volumes of the *Encyclopaedia* were published, but as Morris wrote to Frank (2 June 1965): "it has been a fine enterprise, though only a fragment of what Neurath had planned".

### **3.2 Tintner's volume on economics in the *International Encyclopaedia***

Tintner maintained in his volume that economics can adopt two different methods: mathematical economics and econometrics, both of which are valid tools for raising the scientific level of economics and for including it in the ideal of unified science. Following the

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<sup>21</sup> On comparing the volumes that finally appeared and those scheduled in Neurath and Morris's plan in 1936, one finds that what was planned and then published were the introductory volume on the significance of the unified science (Neurath, Bohr, Russell, Carnap and Morris), the volume on the theory of signs by Carnap, the volume on physics by Frank and the volume on the development of logical empiricism by Joergensen. Volumes on linguistic, psychology and cosmology appeared without being written by the author who had been initially asked to do so: the volume on mathematics was written neither by Menger nor by Gödel, but was assembled into the volume on the foundations of logic by Carnap. In 1944 Neurath published his "Foundation of social sciences" as "an example of the application of 'Logical Empiricism' not only to scientific issues but also to everyday problems that included economics" (Neurath 2004).

overall aim of the Unity of Science Movement, he addressed his text “to a public which does not necessarily consist of economics” (Tintner 1968, p. vii).

The book consisted of three chapters: Mathematical Economics, Econometrics and Welfare Economics and Economic Policy, without any concluding remarks. Mathematical Economics was described in Hilbertian terms: economic theory that “uses the logical-deductive method and derives conclusions from certain fundamental assumptions or axioms, such as rationality and profit maximization” (p.14). Econometrics was described as “an important special method for the evaluation of mathematical economic models in numerical terms and for the verification of economic theories; it uses the methods of modern statistics for this purpose ... based upon applied probability” (p. 56). The final chapter on welfare economics and economic policy was shorter than the previous two (its length is about ten pages): it dealt mostly with the distinction between positive and normative economics and with explanation of the welfare utility function from Bergson to Arrow.

The core of Tintner’s book was the introduction, which started with a definition of economics explicitly borrowed from Robbins and Lange: “the science which studies human behaviour as a relationship between given ends and scarce means which have alternative uses (Robbins 1949, p. 16) or, on the other hand, as the science of administration of scarce resources in human society (Lange, 1953). Tintner specified that the use of mathematics in economic theory had grown increasingly common in previous decades and had become the tool best suited to “theoretical economics”, even if “the bulk of the results of theoretical economics has been achieved without mathematical means” (he recalled the struggle of theoretical economics against the German historical school and the American institutionalist school), and he stated that “mathematical economics and econometrics are the *only* methods for the study of problems in economics”. The aim of economics, according to Tintner, is “to construct fundamental models to apply to concrete economic problems”; he stressed the need to bridge the gap between theoretical concepts and empirical observations. Quoting Carnap and Popper, Tintner recalled the neo-positivist philosophical approach that emphasized the unity of scientific method in the natural and social sciences, and he maintained that economics could be included in this project only when it used mathematics or/and applied it to empirical cases in an econometric sense, because only mathematical economics and econometrics could be regarded as theoretical economics at this stage of the discipline’s development.

### **Concluding remarks**

The migration of ideas is a central theme when one considers the interrelations and connections between Europe and USA during the past century. The project for the *International Encyclopaedia of Unified Science* provides an emblematic example. Born within Viennese logical positivism in the early 1930s, the ideal of building a general methodology able to free all the sciences from metaphysics and to bridge the gap between rationalism and empiricism in an anti-Kantian way attracted the American pragmatists. The fall of Germany and Austria under the brutal Nazi regime obliged the entire movement to move (not just metaphorically), mostly to the USA in the late 1930s, where the “republic of scholars”, to use Neurath’s expression, was able to launch the project of the *International Encyclopaedia* and to found the Unity of Science Movement. It was planned that every science, natural and social alike, would be incorporated into the particular philosophical framework whose roots were in the “new conception of the world” described in the Vienna Circle’s *Manifesto*, where empirical objects were to be described by a new logical and linguistic structure, devoid of metaphysical content, in order to understand and solve real problems.

Economic theory had its own space in this ambitious project. As one of Neurath’s main interests, it was included in the initial program of logical empiricism. For Neurath, economics was to be understood as “political economy” connected with the technical aspects of production and distribution of a society’s wealth. Neurath distinguished between market economy and natural economy and he considered the former to be a particular and historical form of the latter.

When the *International Encyclopaedia* project began its “Americanization” under the direction of Morris (and Carnap, both in Chicago), economic theory was set aside for about twenty years. When a volume on economics was finally scheduled, the result was Tintner’s volume, where economic theory was no longer “political”. It was formalized and described as “theoretical”, and mathematics and statistics were recognized as its only possible tools. Mathematical economics and econometrics, the two sides of mainstream economics still today, were recognized as the final and proper application of logical positivism to economics as a science.

Was this result very different from what Neurath had in mind when he considered including economic theory in the new *Weltauffassung*? In a certain sense, the answer is ‘yes’, because Neurath had in mind a kind of economic theory that was “normative”, while in Tintner’s volume economics reached a “positive” stage, becoming finally a “neutral” science *à la* Robbins-Pareto. On the other hand, a science’s reaching of the positive stage was the final goal of logical positivism and of the project for the *International Encyclopaedia* as a whole.

On considering the historical development of the meaning of economics from Neurath to Tintner (from mid 1930s to mid 1960s) it does not seem coincidental that one of the main causes for its transformation was the Americanization of the project itself.

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