Vienna Circle Institute Yearbook

Maria Carla Galavotti
Elisabeth Nemeth
Friedrich Stadler *Editors*

European Philosophy of Science - Philosophy of Science in Europe and the Viennese Heritage

Springer

EUROPEAN PHILOSOPHY OF SCIENCE – PHILOSOPHY OF SCIENCE IN EUROPE AND THE VIENNESE HERITAGE

VIENNA CIRCLE INSTITUTE YEARBOOK

17

VIENNA CIRCLE INSTITUTE YEARBOOK 17

Institut Wiener Kreis
Society for the Advancement of the Scientific World Conception

Series-Editor:
Friedrich Stadler
University of Vienna, Austria and Director, Institut Wiener Kreis

Editorial Address:

Institut Wiener Kreis
Universitätscampus, Hof 1
Spitalgasse 2-4, A–1090 Wien, Austria
Tel.: +431/4277 46501 (international)
or 01/4277 46501 (national)
Fax.: +431/4277 41297 (international)
or 01/4277 41297 (national)
Email: ivc@univie.ac.at
Homepage: http://univie.ac.at/ivc/

EUROPEAN SCIENCE FOUNDATION

www.pse-esf.org

Maria Carla Galavotti • Elisabeth Nemeth
Friedrich Stadler
Editors

European Philosophy of Science – Philosophy of Science in Europe and the Viennese Heritage

Springer

Editors
Maria Carla Galavotti
Dipto. Filosofia
Università di Bologna
Bologna, Italy

Elisabeth Nemeth
Inst. Philosophie
Universität Wien
Wien, Austria

Friedrich Stadler
Inst. Wiener Kreis
Inst. Philosophie
Inst. Zeitgeschichte
Universität Wien
Wien, Austria

ISSN 0929-6328
ISBN 978-3-319-01898-0 ISBN 978-3-319-01899-7 (eBook)
DOI 10.1007/978-3-319-01899-7
Springer Cham Dordrecht Heidelberg New York London

Library of Congress Control Number: 2013947192

Printed on acid-free paper

Springer is part of Springer Science+Business Media (www.springer.com)

Table of Contents

Editorial 7

Friedrich Stadler, From the Vienna Circle to the Institute Vienna Circle: On the Viennese Heritage in Contemporary Philosophy of Science 9

I

Cristina Chimisso, A Matter of Substance? Gaston Bachelard on Chemistry's Philosophical Lessons 33

Thomas Uebel, Carnap's *Aufbau* and Physicalism: What Does the "Mutual Reducibility" of Psychological and Physical Objects Amount to? 45

Claude Debru, On the Relationship between Neuroscience and Philosophy: the Case of Sleep and Dreaming 57

Richard Creath, (Anti-)Metaphysics in the Thirties: And Why Should Anyone Care Now? 67

II

Maria Carla Galavotti, Probabilistic Epistemology: A European Tradition ... 77

Michael Esfeld, Reductionism today 89

Wlodek Rabinowicz and Lina Eriksson, Betting Interpretation and the Problem of Interference 103

III

Ladislav Kvasz, Mathematics and Experience 117

Eckehart Köhler, Gödel and Carnap. Platonism versus Conventionalism? ... 131

Pablo Lorenzano, What is the Status of the Hardy-Weinberg Law within Population Genetics? 159

IV

Jan Woleński, Kazimierz Twardowski and the Development of Philosophy of Science in Poland 173

V

Tomasz Placek, Vienna Circle on Determinism 183

John D. Norton, Infinite Idealizations 197

VI

Günther Sandner, Political Polyphony. Otto Neurath and Politics Reconsidered 211

Herlinde Pauer-Studer, Kelsen's Legal Positivism and the Challenge of Nazi Law 223

VII

Jeanne Peijnenburg and David Atkinson, Biased Coins. A Model for Higher-order Probabilities 241
Matthias Neuber, Is Logical Empiricism Compatible with Scientific Realism? 249

VIII

Jan Faye, Does the Unity of Science have a Future? 263
Gereon Wolters, Is There a European Philosophy Science? A Wake-up Call .. 277

General Part

Report/Documentation

Veronika Hofer and Michael Stöltzner, Vienna Circle Historiographies 295

18th Vienna Circle Lecture / 18. Wiener Kreis Vorlesung

Dagfinn Føllesdal, Husserl and Gödel on Mathematical Objects and our Access to them 319

Review Essay

Massimo Ferrari, Logical Empiricism in Historical Perspective. Recent Works on Moritz Schlick 357

Reviews

Jan Faye, *After Postmodernism. A Naturalistic Reconstruction of the Humanities*, Basingstoke: Palgrave-Macmillan, 2012. (Thomas Uebel) 367
Paul Feyerabend, *The Tyranny of Science*. Edited by Eric Oberheim. Cambridge: Polity Press 2011. (Daniel B. Kuby) 370
Paolo Parrini, *Il valore della verità.* Milano: Guerini e Associati, 2011. (Beatrice Collina) 375
András Máté, Miklós Rédei and Friedrich Stadler (Eds.), *Der Wiener Kreis in Ungarn / The Vienna Circle in Hungary*. Veröffentlichungen des Instituts Wiener Kreis, Bd. 16. Wien: Springer 2011. (Radek Schuster) 378
Jacques Le Rider, *Fritz Mauthner. Scepticisme linguistique et modernité. Une biographie intellectuelle*. Éditions Bartillat: Paris 2012. Jacques Le Rider, *Fritz Mauthner. Le langage*. Translation of "Die Sprache" from German and foreword by Jacques Le Rider, Éditions Bartillat: Paris 2012. (Camilla Nielsen) 381
Activities of the Institute Vienna Circle 385
Index of Names 391
Abstracts 399

Editorial

The Research Networking Programme "The Philosophy of Science in a European Perspective" (PSE) of the European Science Foundation (ESF) dealt with the philosophies, foundations and methodologies of the sciences. The international symposium "Philosophy of Science in Europe – European Philosophy of Science and the Viennese Heritage" (Vienna, December 5–7, 2011), combined the theoretical and historical perspective focusing on the specific features of a European philosophy of science. On the occasion of the 20th anniversary of the Institute Vienna Circle the Viennese roots and influences were addressed, in addition.

There is no doubt that contemporary philosophy of science originated mainly in Europe beginning in the 19th century and has influenced decisively the subsequent development of globalized philosophy of science, esp. in North America. Recent research in this field documents some specific characteristics of philosophy of science covering the natural, social, and also cultural sciences in the European context up to the destruction and forced migration caused by Fascism and National Socialism.

The proceedings of the opening plenary conference of the Networking Programme PSE, held in Vienna, from December 18–20, 2008, were published in 2010 as The Present Situation in the Philosophy of Science.[1] They document the flourishing topicality of contemporary philosophy of science in Europe. The volume covers foundational and methodological debates, formal methods and their applications, the place of the life sciences and physical sciences in the foundations of science, and the present situation of the philosophy of the cultural and social sciences on the one hand, and some specific European manifestations, on the other hand, which can be generally identified with historical, pragmatic and interdisciplinary approaches bridging the absolute dualism of "analytic" and "continental" philosophy (of science). Therefore, also more general philosophical topics in the sciences are accompanied by a naturalistic approach, taking into account the aims and values of philosophy of science in itself and the consequences for the related

1 *The Present Situation in the Philosophy of Science*. Ed. by Friedrich Stadler, together with Dennis Dieks, Wenceslao J. González. Stephan Hartmann, Thomas Uebel, Marcel Weber. Further volumes in this series "The Philosophy of Science in a European Perspective", ed. by Maria Carla Galavotti and Friedrich Stadler (Dordrecht–Heidelberg–London–New York : Springer 2010f). Vol. 2: Explanation, Prediction and Confirmation. Ed. by Dennis Dieks, Wenceslao J. González, Stephan Hartmann, Thomas Uebel, Marcel Weber (2011). Vol. 3: Probabilities, Laws, and Structures. Ed. by Dennis Dieks, Wenceslao J. González, Stephan Hartmann, Michael Stöltzner, Marcel Weber (2012). Vol. 4: New Challenges to Philosophy of Science. Ed. by Hanne Andersen, Dennis Dieks, Wenceslao J. González, Thomas Uebel, Gregory Wheeler (2013).

methodology (since the *Methodenstreit*) and historiography, obviously within the frame of a theoretical pluralism.

This European perspective with the integration of history and philosophy of science and the current situation in the philosophy of science after the transatlantic interaction and transformation, and the "return" after World War II raised the question of contemporary European characteristics in the philosophy of science. The conference referred to this opening conference and its results aiming at topical issues and open questions between philosophy of science in Europe and European philosophy of science.[2]

On the occasion of the 20th anniversary of the Institute Vienna Circle, and its establishment as Department of the University of Vienna (Faculty of Philosophy and Education) in 2011, the role and function of the renowned Vienna Circle of Logical Empiricism and its impact and influence on contemporary philosophy of science was on the agenda, too. Accordingly, the general topic was addressed in two parallel sessions representing systematic-formal as well as genetic-historical perspectives on philosophy of science in an European context up to the present. The present volume largely contains the English-language contributions to this symposium. The German-language contributions will appear in a parallel volume *Die europäische Wissenschaftsphilosophie und das Wiener Erbe*, Elisabeth Nemeth und Friedrich Stadler (Hrsg.), Dordrecht–Heidelberg–London–New York: Springer, 2013 (= Veröffentlichungen des Instituts Wiener Kreis, Bd. 18).

Thanks go to Maria Carla Galavotti on behalf of the ESF-PSE programme for the joint organization and to the members of the staff of the Institute Vienna Circle – Sabine Koch, Robert Kaller, and Karoly Kokai – for their help regarding the anniversary conference and the publication of the proceedings. The University of Vienna enabled the establishment of the Institute Vienna Circle as a Department in the Faculty of Philosophy and Education, which was pleasingly reinforced on the occasion of the opening of the conference by Vice-Rector Susanne Weigelin-Schwiedrzik and the then Vice-Dean Konrad Paul Liessmann.

Vienna, April 2013

Friedrich Stadler
(Institute Vienna Circle, Head and Director)

2 Review of Stathis Psillos, in: *Metascience*, vol.20, No.2.

Friedrich Stadler

From the Vienna Circle to the Institute Vienna Circle: On the Viennese Heritage in Contemporary Philosophy of Science

The Vienna Circle as part of the intellectual movement of Central European philosophy of science is certainly one of the most important currents for the emergence of modern philosophy of science. Independent from this uncontested historical fact there remains the question of the direct and indirect influence, reception and topicality of this scientific community in contemporary general philosophy of science as well as in the philosophy of the individual sciences, including the social sciences and humanities.

In my account I will focus on the "present situation in the philosophy of science"[1] by identifying some relevant impacts, results, and unfinished projects since the classical Vienna Circle, by dealing with specific European features of this globalized philosophical tradition up to the present, and by exemplifying some future perspectives after the linguistic, historical and pragmatic turns. This reconstruction is partly linked to the history of the Institute Vienna Circle which was established in 1991 in Vienna, and which was a supporting institution of the ESF Research Network Program the "Philosophy of Science in a European Perspective" (PSE) from 2008 to 2013.

1 Analytic philosophy (of science) – the context of modernity

The Vienna Circle, which was part of the intellectual movement of Central European philosophy of science, is certainly one of the most important currents in the emergence of modern philosophy of science. Apart from this uncontested historical fact there remains the question of the direct and indirect influence, reception and topicality of this scientific community in contemporary philosophy of science in general as well as in the philosophy of the individual sciences, including the social sciences and humanities.

First, I will characterize the road from the Schlick Circle to contemporary philosophy of science. Second, I will refer to "the present situation in the philosophy of science" by identifying relevant impacts, findings, and unfinished projects since

1 Friedrich Stadler (Ed.) (2010) *The Present Situation in the Philosophy of Science*, Dordrecht–London–New York: Springer and Friedrich Stadler (2010) "On the Present Situation in the Philosophy of Science", in that volume, p. 7-10.

M.C. Galavotti et al. (eds.), *European Philosophy of Science – Philosophy of Science in Europe and the Viennese Heritage*, Vienna Circle Institute Yearbook 17,
DOI 10.1007/978-3-319-01899-7_1, © Springer International Publishing Switzerland 2014

the classical Vienna Circle. Third, I will address some specific European features of this globalized philosophical tradition up to the present, and outline some future perspectives after the linguistic, historical and pragmatic turns – looking back to the "received view".

2 Viennese and European contexts

In 2011, Edward Timms referred to the Viennese cultural circles entitled "Dynamik der Kreise, Resonanz der Räume. Das Denken der Wiener Moderne" in his Opening Lecture to the anniversary conference as the broader cultural context of the Vienna Circle since Ernst Mach's pioneering role in *Fin de Siécle* Vienna.[2] Herein it becomes clear how the Vienna Circle was part of a modernist movement transgressing the boundaries of philosophy proper.

At the same time this means that the origins and development of Logical Empiricism cannot be equated with the current of analytic philosophy, as it was reconstructed critically already by Georg Henrik von Wright (1993)[3]: this specific branch of philosophy since Frege, Moore, Russell, and Wittgenstein was more or less intertwined with the establishment of Logical Empiricism based mainly on the philosophy of the natural sciences. In parallel, the idea of analytic philosophy can be described as a tradition between a school or as a research field.[4]

Already in 1991, on the occasion of the centenary conference of Carnap, Reichenbach, and Zilsel in Vienna, which was at the same time the opening conference of the Institute Vienna Circle, Carl G. Hempel dealt with the historical, pragmatic, and sociological turns ending up with the inclusion of the pragmatic component according to Neurath's option: [5]

Thus, under the influence if internal and external critical and constructive reflection, the original ideas of the Vienna Circle evolved into a new and very different empiricist con-

2 Publication in: Hubert Christian Ehalt, Friedrich Stadler, Edward Timms, Heidemarie Uhl, *Schorskes Wien: Eine Neuerfindung*. Wien: Picus 2012. His overlapping circles cover poets, musicians, artists, philosophers, and scientists, but also politicians and social reformers. (p. 44). www.vorlesungen.wien.at. In addition: Edward Timms, *Dynamik der Kreise, Resonanz der Räume. Die schöpferischen Impulse der Wiener Moderne*. Weitra 2013.

3 Georg Henrik von Wright (1991) "Analytic Philosophy – A Historical-Critical Account", in: von Wright *The Tree of Knowledge and Other Essays*, Leiden: E. J. Brill.

4 Friedrich Stadler (2011). "The Idea of Analytic Philosophy – A School or Research Field?", Paper, delivered at the University of Innsbruck, Nov.15, 2011 in honor of Edmund Runggaldier. (forthcoming).

5 Carl G. Hempel (1993) "Empiricism in the Vienna Circle", in: Friedrich Stadler, *Scientific Philosophy: Origins and Developments*, Dordrecht-Boston-Londont: Kluwer, p. 8. See also: Rudolf Haller and Friedrich Stadler *Wien – Berlin –Prag. Der Aufstieg der wissenschaftlichen Philosophie*, Vienna: Verlag Hölder-Pichler-Tempsky.

strual of scientific knowledge and of the methodology of scientific inquiry. While surely not initially intended or anticipated, this evolution was in accord with a basic view widely held in the Circle as to how a 'scientific world view' was to be developed: not as a monolithic *a priori* system, but, like empirical science itself, under constant critical appraisal and revision.

The interaction of analytic philosophy and philosophy of science in the "Origins of Analytic Philosophy" remains on the agenda as became apparent from a controversial discussion on the comparison of "analytic" and "continental" proponents of this philosophical journey[6] determined by the distinction as described by Michael Friedman.[7]

Just in this case study, the rhetoric of science becomes apparent: alone the employed terminology and history of concepts indicate the need for systematic clarification and "rational reconstruction" with reference to terms like Scientific Philosophy, Logic of Science, Positivism, Neo-positivism, Logical Empiricism, Encyclopedia of Unified Science, Philosophy of Science, History and Philosophy of Science – as labels for overlapping conceptions between philosophy and the individual sciences.[8]

3 Vienna – Berlin – Prague: central european communication

After more than two decades of research on the "Rise of Scientific Philosophy" (Hans Reichenbach) between Vienna and Berlin it became also clear that Logical Empiricism was certainly not a homogeneous school or discipline in philosophy of science[9], where epistemology, probability and induction was linked to the discovery-justification distinction and different approaches to probabilism and realism emerged already before World War II. Therefore, it is not surprising that Reichenbach in his "Logistic Empiricism in Germany and the Present State of its Problems" (1936) presents a sort of a counter manifesto to that Vienna Circle manifesto of 1929.[10] In any case, it is a significant fact that Hans Reichenbach and

6 As a pre-history: Paul Kruntorad (Ed.) *Jour fixe der Vernunft* (1991), containing contributions by Ludovico Geymonat and Wolfgang Stegmüller dealing with "modern analytic philosophy" and "modern philosophy of science". The discussion took place at the list of the International Society for the History of Philosophy of Science (HOPOS-L) from 9/15/2011 to 9/22/2011.

7 Michael Friedman, (2000) *Parting of the Ways*. Chicago: Open Court.

8 See Thomas Uebel, "'Logical Positivism' – 'Logical Empiricism': What's in a Name?", in: *Perspectives on Science*, 2013, vol. 21, no. 1, pp.58-99.

9 Friedrich Stadler (2011) "The Road to *Experience and Prediction* from within: Hans Reichenbach's Scientific Correspondence from Berlin to Istanbul" in: *Synthese*, 181, Issue 1, p. 137-55.

10 Hans Reichenbach, (1936) "Logistic Empiricism in Germany and the Present State of ist Problems", *The Journal of Philosophy*, Vol. 33, No. 6, p. 141-160. See the reprint

Moritz Schlick, the main proponents and opponents of Logical Empiricism are honoured in the long run by two historical-critical edition projects, in addition to ongoing contributions in the philosophy of science.[11]

Already here we find the contested topics of (philosophical, critical, structural) realism, causality, (subjective and objective) probability and inductivism and the relativized *a priori* with reference to German Neo-Kantianism.

4 Edgar Zilsel – import of history and sociology of science

Besides pure philosophy of science, the history of science and the sociology of science and scientific knowledge were present from the beginning. One representative case study for this long neglected research field is the lifework of Edgar Zilsel. Following his investigation in the problem of induction (*Das Anwendungsproblem. Ein philosophischer Versuch über das Gesetz der großen Zahlen und die Induktion* (1916), his special contributions are documented with two monographs on the history and analysis of the phenomenon and concept of „genius“:
– *Die Geniereligion. Ein kritischer Versuch über das moderne Persönlichkeitsideal, mit einer historischen Begründung* (1918).
– *Die Entstehung des Geniebegriffes. Ein Beitrag zur Ideengeschichte der Antike und des Frühkapitalismus* (1926).
Pleasingly, some of his pioneering studies in the history and philosophy of science are collected in German in the edited volume on *Die sozialen Ursprünge der neuzeitlichen Wissenschaft* (posthum, 1976), contextualizing the famous “Zilsel thesis”:

> From the period from the end of the Middle Ages until 1600 the university scholars and the humanistic literati are rationally trained but they do not experiment as they despise manual labor. … About 1600, with the progress of technology, the experimental method is adopted by rationally trained scholars of the educated upper class. So the two components of scientific search are united at last: modern science is born … (Zilsel 1939).

The translation of his collected articles into English, accompanied by new research contributions, seems to be a late recognition and appraisal of this unique scholar, who committed suicide in 1944 in US exile after a tragic track of life following his forced migration from his home city of “Red Vienna”. In this volume entitled

---

of the Vienna Circle Manifesto: *Wissenschaftliche Weltauffassung. Der Wiener Kreis*. Friedrich Stadler and Thomas Uebel (eds.), (2012) Wien–New York: Springer.

11 *Moritz Schlick Gesamtausgabe*: www.moritz-schlick.de, www.univie.ac.at/ivc/ Schlick-Project and Reichenbach, *Gesammelte Werke*, as well as the special issue of *Synthese* (2011) 181. Reichenbach Edition, Marie Reichenbach and Andreas Kamlah (eds.), Springer.

The Social Origins of Modern Science (2000), the renowned historian of science Joseph Needham wrote on the academic outsider: [12]

> All we can be sure of, and this is where Zilsel's work is a veritable torch to light the darkness, is that we have to look for the 'sociological roots' as well as the purely intellectual ones, of science and technology, whether it be in the West or in the East. Fiat lux, we all cry, and Edgar Zilsel's life and work put him among most notable taperers in the procession of those who seek to understand.

5 Logical empiricism re-evaluated

With a critical re-evaluation of Logical Empiricism in 2001 on the occasion of the 10th anniversary of the Institute Vienna Circle[13] the origins, history and reception, the methods, scientific communication , (self-)organization, sociology of science and knowledge were addressed based on the growing research. The uprooting and alienation from (Central) Europe, the subsequent forced migration to US/UK and transformation of Logical Empiricism with mutual theory dynamics are documented in the proceedings on *The Vienna Circle and Logical Empiricism. Re-evaluation and Future Perspectives* complemented by a special volume on Carnap's role in this respect: *Language, Truth and Knowledge: Contributions the Philosophy of Rudolf Carnap* (ed. Th. Bonk 2003) Again, the three main figures Schlick, Reichenbach, and Carnap came into focus: the question of one or two circles in Berlin and/or Vienna as well as the idea of a common denomination (Logical Positivism, Logical Empiricism, Scientific World Conception, Encyclopedia of Unified Science etc.) challenging the dualism of philosophy and the sciences up to Reichenbach's *Experience and Prediction* (1938) showed the inherent theoretical pluralism. Recurring topics were present with the continuing relationship of "Positivism and Realism" (Schlick 1932), the theoretical pluralism with regard to probability theory, unity and plurality, context of discovery and context of justification, emotivism and meta-ethical non-cognitivism in the broader frame of philosophy of science. New perspectives emerged on women of Logical Empiricism (Rose Rand, Susan Stebbing, Else Frenkel-Brunswik, Olga Hahn, Olga Taussky) and the third generation in philosophy of science, esp. the Schlick's students and guests from abroad born between 1900 and 1912! (We are speaking of some 20 philosophers from Ayer to Tscha Hung = Hong Qian, who succeeded scholarly in the further academic life in their home countries.) This sociology of philosophy is to be still researched with a collective intellectual biography.

---

12 Joseph Needham (2000) "Foreword" in: Edgar Zilsel *The Social Origins of Modern Science*, (Boston Studies in the Philosophy of Science), p. xiv.

13 Friedrich Stadler (2003), "What is the Vienna Circle? Some Methodological and Histiriographical Answers", in: Friedrich Stadler (ed.) *The Vienna Circle and Logical Empiricism*, Wien–New York: Springer, p. xi-xxiii.

6 Viennese origins – european networks

The influence and impact of this Viennese culture has to be connected with European networks proper. Already Kasimir Twardowski studied in Vienna for many years before he acted as the founder of the Polish Lwow-Warsaw School of "logistic anti-irrationalism" leading up to Alfred Tarski and his contemporaries. Anna Brożek (2011) reconstructed the Viennese roots of Twardowski, and opened in her book Tarski's intellectual background. [14]

At the same time, the Brentano tradition and the phenomenological movement in philosophy and philosophy of science becomes manifest: it was above all Felix Kaufmann, the mediator between Husserl, Kelsen and the Vienna Circle, who bridged the gap between these three currents and tried to approach American pragmatism (esp. John Dewey) in his later US exile years. This occurred with the English edition of his *Methodology of the Social Sciences* (1944), which was not directly a translation of his *Methodenlehre der Sozialwissenschaften* (1936), in which he tried to solve the virulent *Methodenstreit* between the social and natural sciences. Independently, the strong presence of Husserl, from Mach to Wittgenstein and the Vienna Circle is another long neglected subject of research.[15]

There is now doubt about Ernst Mach's role and function as one precursor and pioneer of the Vienna Circle and Logical Empiricism, especially as a model for history and philosophy of science (HPS), which is currently discussed with reference to the context of discovery and context of justification distinction.[16] With his "Chair for Philosophy, particularly for the History and Theory of the Inductive Sciences" (1895) he succeeded as one of the few scientists who took over a chair in philosophy and introduced the "historical-critical method" into philosophy (of science). His impact can hardly be overrated, even if there were modifications, selective reception, and also hidden manifestations, which can be demonstrated by his influence on Wittgenstein[17] and Paul Feyerabend,[18] who in his later years came back to Mach and fostered the historical tradition in the philosophy of science – besides the uncontested Boltzmann tradition. These new contextualizations

14 Anna Brożek (2011) *Kazimierz Twardowski. Die Wiener Jahre*, Wien–New York: Springer.

15 As one exception see the Vienna Circle Lecture of Dagfinn Foellesdal on Husserl and Gödel in this volume.

16 Friedrich Stadler (2012), "History and Philosophy of Science: Between Description and Construction", in: *New Directions in the Philosophy of Science*. Ed. by Maria Carla Galavotti, Dennis Dieks, Wenceslao J. Gonzalez, Stephan Hartmann, Thomas Uebel, Marcel Weber, Springer, to appear in 2014.

17 J. Hintikka (2001) "Ernst Mach at the Crossroads of Twentieth-Century Philosophy", in: Juliet Floyd and Sanford Shieh (eds.) *Future Pasts. The Analytic Tradition in Twentieth-Century Philosophy*, Oxford University Press, p. 81-100.

18 Friedrich Stadler and Kurt R. Fischer (Eds.) (2006) *Paul Feyerabend – Ein Philosoph aus Wien*, Wien–New York: Springer.

are accompanied by the running *Ernst Mach Studienausgabe* (2008 f.), which will be completed by the forthcoming anniversary in 2016.[19]

The "French connection" was already at work with Mach at the heydays of the Vienna Circle, where the networking with the English-speaking community and the French scholars was at par before the forced migration and transformation of the philosophers of science.[20]

Similarly, even if somewhat stronger, the Austro-British Interaction since the Russell-Meinong exchange in 1905 emerged thereby challenging the analytic-continental split in the philosophy of science, which flourished till the outbreak of WW II, e.g. with the "Fourth International Congress for Unity of Science" in Cambridge (Girton College) in 1938.[21]

Only in the last decade there was a special focus on the traditional interaction between the community in the Nordic Countries and the Central European philosophy of science, as presented by Eino Kaila, Georg Henrik von Wright, Arne Naess, up to Jaakko Hintikka. This was the main topic of a conference in Helsinki and its proceedings on *The Vienna Circle in the Nordic Countries*[22]*,* referring once more to realism, empiricism, psychologism and paving the way to experimental philosophy (of science), represented by Arne Naess.

7 Moritz Schlick – between realism and empiricism

The rediscovery and re-evaluation of Moritz Schlick's life and work is going on with the running historical-critical *Schlick Edition Project* accompanied by the *Schlick Studies* and *Schlickiana,* since 2006 a cooperation between the Institute Vienna Circle with the University of Rostock, the Moritz Schlick Research Unit (Moritz Schlick-Forschungsstelle).[23]

The first part of the edition is nearly finished with the publication of Schlick's *Allgemeine Erkenntnislehre, Reflexion des Lichtes / Raum und Zeit, Lebensweisheit / Fragen der Ethik,* and the collection of articles of his *Die Wiener Zeit.* In addition, the research oriented *Schlick Studien* (2008f.), offer most recent studies in the philosophy of the founder of the Vienna Circle, contributed also by a young-

19 *Ernst Mach Studienausgabe*, Ed. Friedrich Stadler, Berlin: Xenomoi, 2008f.

20 Elisabeth Nemeth / NicolasRoudet (Eds.), *Paris – Wien. Enzyklopädien im Vergleich*, Wien–New York: Springer 2005.

21 On the Austro-British exchange: Timms (Ed.), and Maria Carla Galavotti (Ed.) (2004) *Cambridge and Vienna. Frank P. Ramsey and the Vienna* Circle, Wien–New York: Springer.

22 Manninen/Stadler (Eds.) (2010) *The Vienna Circle in the Nordic Countries*, Wien–New York: Springer.

23 www.univie.ac.at/ivc/Schlick-Project and www.moritz-schlick.de: *Moritz Schlick-Gesamtausgabe* (MSGA): Wien–New York: Springer. 2006f.

er generation from the editorial team.[24] A intellectual biography by Massimo Ferrari will accomplish this long term project, which is funded by the Hamburgische Akademie in the meantime. There was , and is a lot of investigation on the relation between Einstein and Schlick, who exerted a decisive influence on the former as the first acknowledged philosophical interpreter of relativity theory although from the middle of the 1920s the occurred a certain alienation due to Schlick's linguistic turn under the influence of Wittgenstein. Despite the modification of his earlier critical realism as "turning point in philosophy" there is also evidence for continuity between the young Schlick in Germany and the later one of his Vienna Circle period, as is reconstructed by Hans Jürgen Wendel (2013) in „Moritz Schlick and the Metaphysics" claiming this red thread with reference to his relation to (neo-Kantian) metaphysics.[25] Besides this controversial topic the difference between Schlick and Neurath stays on the agenda: theoretical pluralism, naturalism and the vision of a unity of science is the topical frame leading up to the dualism of philosophy and the sciences with correspondence theory on the one hand, and the empiricist encyclopedia project with a coherentist variant, on the other. This unfinished internal dispute indicates the variety of Logical Empiricism, especially regarding philosophical and structural realism, "consistent empiricism" (Schlick) and the inclusion of values and ethic into the concept of scientific philosophy in general.[26]

8 Rudolf Carnap – philosophy of science today

It's not a surprise that the most systematic philosopher of science is a permanent research subject in contemporary philosophy of science: besides the *The Cambridge Companion to Carnap*[27] this focus was enriched by a conference on *Carnap and the Legacy of Logical Empiricism* (R. Creath 2012) published as proceedings of a conference organized by the Institute Vienna Circle. Based on the running edition

24 Friedrich Stadler, Hans Jürgen Wendel (Eds.) *Stationen. Dem Philosophen und Physiker Schlick zum 125. Geburtstag (2009)*, *Moritz Schlick Studien,* Band 1. Wien–New York: Springer. M. Neuber (2011) *Die Grenzen des Revisionismus. Schlick, Cassirer und das „Raumproblem"*, *Schlick Studien,* Band 2, Wien–New York: Springer; Johannes Friedl (2013) *Konsequenter Empirismus. Die Entwicklung von Moritz Schlicks Erkenntnistheorie im Wiener Kreis*, *Moritz Schlick Studien Band 3*, Wien–New York: Springer.

25 This Vienna Circle Lecture 2011 is published in the German volume of the proceedings: Elisabeth Nemeth / Friedrich Stadler (Hrsg.), *Die europäische Wissenschaftsphilosophie und das Wiener Erbe*. Dordrecht: Springer (forthcoming).

26 An updated discussion in Anne Siegetsleitner (Hrsg.), *Logischer Empirismus, Werte und Moral*, Wien–New York: Springer 2010.

27 Richard Creath and Michael Friedman (2007), Cambridge University Press.

project *Collected Works of Carnap*[28] we experience a remarkable renaissance on the *Aufbau* project (1928) since Alan Richardson's reconstruction.[29]

From a specific point of view, it is remarkable to see the continuity and renaissance of research on Carnap's life and work: first, the *Collected Works of Rudolf Carnap*, the *Cambridge Companion to Carnap*, together with the intellectual biography by A. W. Carus, *Carnap in Twentieth Century Thought: Explication as Enlightenment* (2007). Not least the *Aufbau* project is reconstructed and reformulated promising as a still viable model in the philosophy of science. e.g., Hannes Leitgeb wrote (in his "New Life for Carnap's *Aufbau*?"):[30]

> Carnap's *Der logische Aufbau der Welt* … is generally conceived of as being the failed manifesto of logical positivism. … How much of the *Aufbau* can actually be saved? We will argue that there is an adaption of an old system which satisfies many demands of the original pogramme. In oder to defend this thesis, we have to show how a new ‚Aufbau-like' programme may solve or circumvent the problems that affected the original *Aufbau* project. In particular, we are going to focus on how a new system may address the well-known difficulties in Carnap's *Aufbau* concerning abstraction, dimensionality, and theoretical terms.

Recently, David J. Chalmers (Introduction to *Constructing the World*? – „A structuralist response to skepticism") undertook a huge (re)construction of Carnap's vision in his recent book via the concept of "scrutability":[31]

> In many ways, Carnap is the hero of this book. Like the other twentieth century logical empiricists, he is often dismissed as a proponent of a failed research program. But I am inclined to think that Carnap was fundametally right more often than he was wrong. I do not think that he was right about everything, but I think that many of his ideas have been underappreciated. So I might see this project, in part, as aiming for a sort of vindication. The title of this book is a homage to Carnap's 1928 book *Der logische Aufbau der Welt*, usually translated as either *The Logical Construction of the World* or *The Logical Structure of the World*.

Within the Vienna Circle Institute this perspective was already manifest in the conferences and publications, like the edited volumes of Thomas Bonk (*Language, Truth and Knowledge,* 2003), and Richard Creath (*Rudolf Carnap and the Legacy of Logical Empiricism,* 2012). All these elaborations are not really surprising, given Carnap's own late conviction that the unfinished *Aufbau* program principally could work out after some revisions.[32]

---

28 *Collected Works of Rudolf Carnap*, Chicago: Open Court (www.opencourtbooks.com).

29 Alan Richardson(1998) *Carnap´s Construction of the World. The* Aufbau *and the Emergence of Logical Empiricism*, Cambridge University Press.

30 Hannes Leitgeb (2011) "New Life for Carnap's *Aufbau*?", *Synthese* 2011/180.

31 David J. Chalmers (2012) *Constructing the World*, Oxford University Press, p. 17.

32 Rudolf Carnap (1961), *Der logische Aufbau der Welt. Scheinprobleme in der Philosophie*. Hamburg: Meiner. Vorwort zur zweiten Auflage, S. IX.

9 Neurath's boat rediscovered – the "visual turn"

In the long run, Neurath's Boat was re-discovered, in parallel with the pictorial turn: W. V. O. Quine, since his influential "Two Dogmas of Empiricism" (1951) refers in his *Word and Object* (1960) (dedicated "to Rudolf Carnap. Teacher and Friend") to Neurath in German: "Wie Schiffer sind wir, die ihr Schiff auf offener See umbauen müssen, ohne es jemals in einem Dock zerlegen und aus besten Bestandteilen neu errichten zu können", which confirms the development and criticism of Logical Empiricism from within leading up to further so called dogmas as a product of the transfer and transformation of the philosophy of science from the "Vienna Circle to Harvard Square" (Holton)[33]. With this process we can see the tension between Carnap and Neurath regarding semantics and the correspondence theory of truth as well as the emergence of the Duhem-Neurath-Quine thesis comprising methodological holism and non-reductive naturalism. The pioneering work of multi-faceted life and work of Neurath[34] between *Encyclopedia and Utopia*[35] was dealt with, also in the context of the formation of Logical Empiricism already before World War I as the "first Vienna Circle" before the arrival of Schlick in 1922.[36]

Neurath's oeuvre covers so far neglected topics like sociology, social sciences and economy, besides his long term project of the interdisciplinary *International Encyclopedia of Unity of Science* in the midst of the global economic crisis, there is also the idea of an ecological economy (in kind) criticizing the exclusive dominating monetary market (it is the alternative of Neurath vs. Hayek between plan and market).

In addition, the trendy "visual turn" in the cultural sciences and museology was the second important innovation of Neurath's "Vienna Method of Pictorial statistics" and Isotype (International System of Typographic Picture Education) as tools for popularisation and humanisation of knowledge and science, complementing the argumentation by written language. [37]

A quick reconsideration of Neurath's lifework uncovers easily the topicality in the history and philosophy of science: a methodological and reflexive relativism, empiricism and naturalism embedded in the unity of science model vs. any

33 Gerald Holton, "From the Vienna Circle to the Harvard Square: The Americanization of a European World Conception", in: Friedrich Stadler (Ed.), *Scientific Philosophy: Origins and Developments*. Dordrecht–Boston–London 1993, pp. 47-74.

34 Jordi Cat, Nancy Cartwright, Lola Fleck and Thomas Uebel (1996) *Otto Neurath: Philosophy Between Science and Politics*, Cambridge University Press.

35 Elisabeth Nemeth and Friedrich Stadler (Eds.) (1996) *Encyclopedia and Utopia. Otto Neurath (1882-1945)*, Wien–New York: Springer.

36 Thomas Uebel (2000) *Vernunftkritik und Wissenschaft. Otto Neurath und der Erste Wiener Kreis*, Vienna/ New York: Springer.

37 Richard Heinrich, Elisabeth Nemeth, Wolfram Pichler, David Wagner (Eds.) (2012) *Image and Imaging in Philosophy, Science and the Arts*, Heusenstamm: Ontos.

"system" with foundational intention. We realize a pluralism covering the natural and social sciences and fighting any form of „pseudo-rationalism" (verification and falsification).

10 Arne Naess – a road to empirical semantics and "experimental philosophy"

One of the many guests in the Schlick-Circle from abroad was the young Arne Naess (1912–2009) from Oslo, who elaborated a radical empiricism by overcoming Carnap and Neurath. His plea for "models instead of theories and systems", "research vs. science", and empirical vs. logical semantics (according to Neurath's "Gelehrtenbehavioristik") is paving the way for contemporary experimental philosophy,[38] already elaborated in his Vienna Years in the 1930s, e.g., in his *Wie fördert man die empirische Bewegung? Eine Auseinandersetzung mit dem Empirismus von Otto Neurath und Rudolph Carnap* (1937–39, published 1956), especially in his dissertation *Erkenntnis und wissenschaftliches Verhalten* (1936), followed by *Truth as Conceived by Those who are not Professional Philosophers* (1938) and the late monograph *From an Empirical Point of View* (1992) – obviously contrasting Quine's *From a Logical Point of View* (1953). All these publications seem to be anticipations of the sociological turn in epistemology and philosophy of science, drawing on contextual meaning based on epistemological scepticism.

Together with Egon Brunswik's *Wahrnehmung und Gegenstandswelt* (1934) and *The Conceptual Framework of Psychology* (1952), Naess had planned to contribute to Neurath's *Encyclopedia* project.

This biography is only one example for the flourishing networking between the Vienna Circle and the philosophers in the Nordic countries, like Eino Kaila (who, by the way, coined the term "logical empiricism") and G. H. von Wright between the wars dealing with critical and structural realism, inductivism and probabilism, the semantic turn and the relation between psychology and "scientific philosophy".[39]

38 K. A. Appiah "Experimental Philosophy," Presidential Address to the Eastern Division of the American Philosophical Association, 2007. Proceedings and Addresses of the American Philosophical Association Vol. LXXXII No. 2.(November 2008): 7-22.

39 Manninen, Juha; Stadler, Friedrich (Eds.) (2010) *The Vienna Circle in the Nordic Countries*, Wien–New York: Springer.

11 Friedrich Waismann between Schlick and Wittgenstein: Vienna-Cambridge-Oxford

Addressing the "Wittgenstein-connection" we have to reconsider the triangle Schlick, Waismann and Wittgenstein, especially the tragic and dramatic relation of Waismann and Wittgenstein in Vienna and in British exile.[40] This recent research on the interaction of the Vienna Circle and Wittgenstein shows the conflict-laden communication and the difficult personal relations of the latter with some members like Carnap, including with priority disputes (surprisingly just on physicalism) and the role and function of philosophy vis a vis the sciences. A reconstruction of these intellectual and personal relations results in a confirmation of the Anti-Wittgensteinian formation with Carnap, Menger and Neurath, the continuing differences of Schlick and Wittgenstein despite of Schlick's linguistic "turn in philosophy" (1930), but also the relative independent philosophical development of Waismann (especially in Oxford), even if strongly influenced by Wittgenstein till his forced emigration in 1938 to Cambridge. After the refusal of Wittgenstein to stay in contact with his former collaborator and interpreter, Waismann further developed analytic philosophy, e.g., language strata, providing the concepts of porosity, vagueness and speech act contexts. He also contributed to philosophy of science with reformulations of probability, causality, verifiability and language analysis, open texture, argumentation theory, as becomes manifest in his *The Principles of Linguistic Philosophy* (posthumous 1965), or in his *Introduction to Mathematical Thinking* (1936/1951, with a preface by the mathematician Karl Menger).

One may ask, whether Waismann is one of the forgotten pioneers of analytic philosophy with two origins as referred to by G. H. von Wright, who cites Waismann's, "Was ist logische Analyse?" (*Erkenntnis* 8, 1939/40) and Max Black's, "Relations between logical positivism and the Cambridge School of Analysis" (*Erkenntnis* 8, 1939/40) for this early manifestation of the "analytic" (as opposed to "continental") tradition in philosophy.

One episode is worth mentioning with regard to the emergence of "historical epistemology" by Ludwik Fleck, who contacted Schlick in order to find a publisher for his path breaking book *Entstehung und Entwicklung einer wissenschaftlichen Tatsache* (1935). The published correspondence between the two is a nice document to re-evaluate the image of Fleck as an exclusive alternative to Logical Empiricism between context of discovery and context of justification.[41]

---

40 Brian McGuinness (Ed.) (2011) *Friedrich Waismann – Causality and Logical Empiricism*, Wien–New York: Springer.

41 On the relation between Fleck und Schlick: "Briefwechsel mit Moritz Schlick (1933–1934)" in: Sylwia Werner and Claus Zittel (Eds.) *Ludwik Fleck, Denkstile und Tatsachen*, Frankfurt a. Main: Suhrkamp, p. 561-565.

12 The 'Third Vienna Circle': Arthur Pap and the renaissance of analytic philosophy (of science)

Another initiative in the history of Logical Empiricism is to be mentioned in the context of the post-war developments in Europe: the "third Vienna Cicle" around the late Viktor Kraft from 1949–1953, who as the last member of the former Schlick circle organized a permanent discussion group, attended by Elizabeth Anscombe, Bela Juhos, Walter Hollitscher, Ernst Topitsch, Georg Henrik von Wright, Wolfgang Stegmüller, Arthur Pap, and Paul Feyerabend, inter alia. Especially, the young Pap as a Fulbright visiting professor in 1953/54 engaged Paul Feyerabend as his assistant and exerted a remarkable influence during his stay, at least with his book on *Analytische Erkenntnistheorie* (compiled by Feyerabend) as an attempt to revive the heritage of the Vienna Circle at the University of Vienna after the forced migration and expulsion of its members latest with the "Anschluss" in 1938.

The failed attempt to achieve an appointment in Vienna and the early death of Arthur Pap obscured his innovative contributions to the renaissance of analytic philosophy.[42]

Specific elements of his research were the adherence to empiricism with intuitive knowledge, a model-theoretic account of logical consequence, and dispositional and modal concepts which anticipate Kripke's later work. Pap's functional a priori between conventionalism and pragmatism can be regarded as another version of the relativized a priori anticipating the research of Michael Friedman.[43]

Viktor Kraft in his "Third Vienna Circle" promoted a critical or constructive realism, rejected meta-ethical non-cognitivism, and accepted theoretical entities by overcoming the "two dogmas", which Wolfgang Stegmüller extended with some further critique of Logical Empiricism with the establishment of analytic philosophy of science (Analytische Wissenschaftstheorie).[44]

---

42 *The Limits of Logical Empiricism*. *Selected Papers of Arthur Pap*. (2006) Alfons Keupink and Sanford Shieh (Eds.), Dordrecht: Springer..The Institute Vienna Circle received the Pap collection from his family, which will bet the basis for a research project on the renaissance of analytic philosophy.

43 David J. Stump (2011) "Arthur Pap's Functional Theory of the A Priori", *HOPOS Journal*, Vol. 1, No. 2, p. 273-290.

44 On these postwar developments see the contributions in: Friedrich Stadler (Hrsg.), *Vertreibung, Transformation und Rückkehr der Wissenschaftstheorie. Am Beispiel von Rudolf Carnap und Wolfgang Stegmüller.* Wien–Berlin: LIT Verlag 2010.

13 Continental interactions – finno-ugrian traditions

As to the international relations, we are aware of the well known interactions in "scientific philosophy" between Vienna, Berlin, and Prague between the two World Wars.[45]

Less known is the fate of the Vienna Circle in Hungary before and after WW II with the ideological rejection of "positivism" under the influence of communism. Nevertheless, we can discover a remarkable influence before and even after 1945: first, via the Brentano-School and experimental psychology, and especially by the so called "Galileo Circle" under the influence of Mach (with its members Karl and Michael Polanyi, Karl Mannheim, Georg Lukacs, and conducted by Julius Pikler). In addition, after WW I the Hungarian tenets of Bela Juhos, Egon Brunswik, Eugen Lukacs, John von Neumann, John Harsanyi becomes manifest with the reception of modern logic, quantum physics and game theory (L. Kalmár), the latter currently active with the "Budapest school" on probabilistic causality, esp. on Reichenbach's Common Cause Principle.[46]

On the other side, the emergence of scientific philosophy was crucially enriched by the interactions with philosophers in the Nordic countries, as can be drawn from the permanent scholarly exchange with the community between Vienna, Copenhagen, Helsinki, Gotheburg, Uppsala, and Oslo.[47] An important role played the journal *Theoria*, ed. by Ake Petzäll and others in Sweden (with Ernst Cassirer in exile) and addressing besides Logical Empiricism also Hans Kelsen's pure theory of law (with Alf Ross as central proponent).[48]

One culmination of this "Nordic connection" since Kaila and the Vienna Circle was the organisation of the 2nd International Congress for the Unity of Science in Copenhagen on the main topic causality (Niels Bohr, Joergen Joergensen, Arne Naess et al.).

After 1945 just these contacts (cautiously continued by Viktor Kraft in his Viennese inner exile) where continued by Paul Feyerabend before his departure from Vienna in the late 1950s.[49] It seems that the dominant transfer and transformation of the former Vienna Circle members to the Anglo-Saxon world after World War

45 See the proceedings of the opening conference of the Vienna Circle: Rudolf Haller and Friedrich Stadler (Ed.) *Wien–Berlin–Prag. Der Aufstieg der wissenschaftlichen Philosophie*, Vienna: Hölder-Pichler-Tempsky; and Friedrich Stadler (Ed.) *Scientific Philosophy. Origins and Developments*, Wien–New York: Springer.

46 See the proceedings of a long term bilateral project *The Vienna Circle in Hungary*: András Máté, Miklós Rédei, Friedrich Stadler (Eds.) *Der Wiener Kreis in Ungarn*, Wien–New York: Springer.

47 Manninen, Juha; Stadler, Friedrich (Eds.) (2010) *The Vienna Circle in the Nordic Countries*, Wien–New York: Springer.

48 Johan Strang, (2010) *History, Transfer, Politics. Five Studies on the Legacy of Uppsala Philosophy*. Tampere: Juvenes Print..

49 Friedrich Stadler and Kurt R. Fischer (Eds.) *Paul Feyerabend – Ein Philosoph aus Wien*, Wien–New York: Springer.

II obscured this productive communication in the long run, reinforced by the Cold War developments.[50]

14 Intra-continental networking between east and west

The "French Connection": Since the early reception and critique of conventionalism before World War II in the "first Vienna Circle" following the exchange between Mach, Pierre Duhem and Henri Poincaré, with Friedrich Adler as mediator, this remarkable networking with the French philosophers like Marcel Boll lasted till the outbreak of the war, with the two highlights in Paris 1935 (the 1st Congress for the Unity of Science) and in 1937 (3rd Congress for the Unity of Science and Congrès Descartes).[51]

A reconsideration of this nearly forgotten "French connection" confirms the impression of the importance of these events and mutual influences for the formation of the *International Encyclopedia of Unified Science* edited by Rudolf Carnap, Charles Morris, and Otto Neurath 1938ff. under most difficult academic and political circumstances.[52] With this theoretical initiative the tension between a preferred empiricism as a "mosaic of the sciences" (Neurath) and the semiotic conception of the sciences (Carnap and Morris) became apparent, which faded out after the unexpected early death of Neurath in British exile in 1945.

The liberalization of methodological and epistemological rules in the philosophy of science was already set in Vienna with the individual contributions by Alfred Tarski, Karl Menger, Carnap and Kurt Gödel: the emergence of the "principle of tolerance" and the semantic turn is only one indicator for the theoretical pluralism, which was apparent in the (philosophy of) mathematics and logic dealt with in Menger's "Mathematical Colloquium" in parallel to the Schlick Circle.[53] The theories of truth and confirmation, philosophical and mathematical logic, proof theory and meta-languages appeared on the agenda of the circles, latest with Tarski's input in the correspondence-theoretic tradition since Boltzmann, followed by

50 Ilkka Niiniluoto / Sami Pihlström (eds.) (2012) *Reappraisals of Eino Kaila's Philosophy*. Helsinki: Philosophical Society of Finland.

51 Philipp Frank (1949) "Introduction: Historical Background", in: Frank, *Modern* Science *and its Philosophy*, Cambridge, Mass.

52 *Paris – Wien. Enzyklopädien im Vergleich*. Ed. by Elisabeth Nemeth und Nicolas Roudet. Wien–New York: 2005.

53 Eckehart Köhler, Werner DePauli-Schimanovich and Friedrich Stadler (Eds.) (1995) *The Foundational Debate: Constructivity and Complexity in Mathematics and Physics*, Wien–New York: Springer. Jan Wolenski (Ed.) (1998) *Alfred Tarski and the Vienna Circle. Austro-Polish Connections in Logical Empiricism*, Wien–New York: Springer. On the "Mathematischen Kolloquium": Karl Sigmund and E. Dierker (Eds.) *Karl Menger – Ergebnisse eines Mathematischen Colloquiums*, Springer Wien–New York, 1998.

Feigl, and Kraft leading up to Popper's *Logic of Scientific Discovery* in a realistic epistemology.

The tragic split between the close friends Neurath and Carnap stayed unresolved, as became manifest with the latter's "Empiricism, Semantics and Ontology" (1950). It is a puzzling fact that the young Arne Naess accused both of them of having lost the consequent empiricism.[54]

15 The austro-british interaction since 1900

Since the debate between Bertrand Russell and Alexius Meinong "On Denoting" (1905) and the subsequent first encounters of Wittgenstein in Cambridge, the story of „The *Wiener Kreis* in Great Britain" between the two world wars is a preceding counterpart of "The Wiener Kreis in North America" as first described by Herbert Feigl in 1968.[55]

Further on, the meetings of Frank P. Ramsey, Schlick, Waismann and Wittgenstein in Vienna,[56] and the continuation of Neurath and Waismann in Oxford are manifestations of the most important role of British (analytic) philosophy for the development of Logical Empiricism proper. See for exampe the translations of Carnap's work by Max Black 1934f. and the re-establishing of the Isotype-movement in Britain, with A. J. Ayer's pivotal book *Language, Truth and Logic* (1936) enabled the internationalization of the Vienna Circle which culminated with the 4th Congress for the Unity of Science in Cambridge, mainly supported by Susan Stebbing as the leading figure of an import of the "Logical Positivism" in the context of analytic philosophy as developed in England independently. By the way, the the myth of the "Poker-Story" between Wittgenstein and Popper is only one more symptom for the divergences within the domain between linguistic and scientific philosophy.[57]

After the war, the third Vienna Circle around Viktor Kraft with Lakatos and Feyerabend paved the way to the historical-sociological turn at the LSE Sym-

54 See my account on Naess, "Arne Naess: Dogmas and Problems of Empiricism" in: Manninen/Stadler (eds.) (2010) *The Vienna Circle and the Nordic Countries*, Wien–New York: Springer, p. 11-31.

55 Herbert Feigl, "The 'Wiener Kreis' in America", in: D. Fleming / B. Baylin (Eds.) *The Intellectual Migration 1930–1960,* Cambridge, Mass, p. 630-73 Friedrich Stadler, "The Wiener Kreis in Great Britain: Emigration and Interaction in the Philosophy of Science", in: Edward Timms / Jon Hughes (Eds.), *Intellectual Migration and Cultural Transformation. Refugees from National-Socialism in the English-Speaking World.* Wien–New York: Springer 2003, pp. 155-180.

56 Maria Carla Galavotti (Ed.) (2004) *Cambridge and Vienna. Frank P. Ramsey and the Vienna* Circle, Wien–New York: Springer.

57 On the so called Poker Story: David Edmonds and John Eidinow (2001) *Wittgenstein´s Poker: The Story of a Ten-Minute Argument Between Two Great Philosophers*, New York: Harper Collins.

posium 1965 with Feyerabend, Kuhn, Popper, Lakatos, Toulmin, Watkins and others,[58] and the attempt to bridge the gap of the Stegmüller School adhering the structuralist view of scientific theories.[59]

16 Transatlantic interactions: Europe and America

The story of this dramatic move was described by Gerald Holton "From the Vienna Circle to the Harvard Square"[60] – a history of the philosophy of science in the context of the forced migration, as the transfer and transformation of Logical Empiricism from Europe to America 1930ff.[61] Recent research has uncovered both the *Origins of Logical Empiricism* (Giere and Richardson 1996) and the *Logical Empiricism in North America* (Hardcastle/Richardson 2004), mainly with reference to the convergence and divergence with (Neo-)Pragmatism represented by P. W. Bridgman, C. I. Lewis, J. Dewey, W. V. O. Quine and others. The re-transfer after World War II is now reconstructed with the come back of a modified normative analytic philosophy of science (Logik und Analytische Wissenschaftstheorie).[62]

Besides this often presented success story only in the last years some significant Latin American Relations came in the focus of the scholarship in the exile studies on the Nazi-period: the Jewish emigration to Latin and South America[63] unearthed an early inter-continental dialogue since the reception of Mach in Columbia to the more direct influence exerted by the former Schlick student Hans Lindemann in Buenos Aires, most likely followed by the work of Mario Bunge and Alberto Coffa till their academic presence in the US and Canada.[64] A first account

58 Imre Lakatos and Alan Musgrave (Eds.) (1970) *Criticism and the Growth of Knowledge*, Cambridge University Press.

59 Friedrich Stadler (Ed.) (2010) *Vertreibung, Transformation und Rückkehr der Wissenschaftstheorie: Am Beispiel von Rudolf Carnap und Wolfgang Stegmüller*, Münster: LIT Verlag as a documentation of a research project, funded by the FWF at the Institute Vienna Circle on "History and/or Philosophy of Science" with the project investigators Christian Damböck, Hans-Joachim Dahms, Christoph Limbeck-Lilienau, Michael Schorner.

60 Gerald Holton (1993) "From the Vienna Circle to Harvard Square: The Americanization of a European World Conception", in: Friedrich Stadler (Ed.) *Scientific Philosophy: Origins and Developments*, Wien–New York: Springer 1993.

61 Friedrich Stadler (2012), "History and Philosophy of Science: Zwischen Deskription und Konstruktion", in: *Berichte zur Wissenschaftsgeschichte* 35 (2012), 217-238.

62 Michael Schorner "Comeback auf Umwegen: Die Rückkehr der Wissenschaftstheorie in Österreich" and Hans-Joachim Dahms "Stegmüller und das Comeback der Wissenschaftstheorie in Deutschland", in: Friedrich Stadler (Ed.) (2010) *Vertreibung, Transformation und Rückkehr der Wissenschaftstheorie: Am Beispiel von Rudolf Carnap und Wolfgang Stegmüller*, Münster: LIT Verlag, p. 189-252 and p. 271-340..

63 Alexander and Barbara Litsauer (Eds.) (2010) *„Verlorene Nachbarschaft". Jüdische Emigration von der Donau an den Rio d la Plata*, Vienna: Mandelbaum Verlag.

64 Friedrich Stadler, "Zum Umgang mit der Vergangenheit in Österreich nach 1945", in:

of R. Campis and E. Bermudez Barrera on "Intercultural Dialogue in Philosophy: Julio Enrique Blanco, Hans Lindemann, Wittgenstein and the Austrian Tradition" (2006) is just the beginning of an investigation into this still unresearched field.

This can be said likewise of the oeuvre of another student of Schlick's (1935/36), the Portuguese Delfim Santos in Portugal who made an important academic and political career after his return to Lisbon before and during World War II.[65]

17 Emotivism and meta-ethical noncognitivism: norms and values revisited

Despite the most influential characterization of Logical Empiricism as a movement of emotivism based on the dualism of is-ought and facts-values, there is a gradual reconstruction and re-evaluation showing a pluralist standpoint with no consensus in the logical and epistemological status of value statements. Although ethics and moral philosophy was certainly not in the center of Vienna Circle's philosophizing, there is a surprising evidence for more or less explicit treatment of values instead of a replacement of ethics by meta-ethics already from the 1920s on: explicit ethical writings of Moritz Schlick (*Fragen der Ethik*, 1930), Otto Neurath (1931/1944), Rudolf Carnap ("Theoretische Fragen und praktische Entscheidungen", 1934), Karl Menger (*Moral, Wille, Weltgestaltung*, 1934), Felix Kaufmann (*Methodenlehre der Sozialwissenschaften*,1936/1944), Viktor Kraft (*Grundlagen einer wissenschaftlichen Wertlehre*, 1937), Friedrich Waismann and Josef Schächter (1938), Richard von Mises (*Kleines Lehrbuch des Positivismus/ Positivism*, 1939/1951) reveal the attitude of dealing with norms and values rationally and logically within the frame of "rational reconstruction".[66] Additionally, the inclusion of Dewey's "Theory of Valuation" and Abraham Edel's *Science and the Structure of Ethics* (1961) document the willingness of taking the issue of the descriptive-normative distinction seriously, leading up to different solutions. Not least, the emerging game and decision theory facilitated the overcoming of an early verificationism claiming the exclusion of value statements without any meaning. Even the late Carnap, with his research into probabilism, inductivism and theory choice (together with Richard Jeffrey) admitted value based reasoning in the long run – despite the principally well accepted dualism of normative and descriptive statements.

Alexander Litsauer / Barbara Litsauer (Hrsg.), *Verlorene Nachbarschaft. Jüdische Emigration von der Donau an den Rio de la Plata*. Wien: Mandelbaum 2010, pp. 223-231.

65 Cf. the running Santos-project in Lisbon: www.delfimsantos.org/VIENNA_PAPERS.htm.

66 A first overview and analysis in: Friedrich Stadler "Wissenschaftliche Weltauffassung und Kunst. Zur werttheoretischen Dimension im Wiener Kreis", in: *Deutsche Zeitschrift für Philosophie* 4, 1995, 635-651.

A re-evaluation of this complex matter – of course, rejecting any value realism and the Kantian categorical imperative – provides a stronger differentiated image of the is-ought question of the whole logical-empirical movement.[67]

18 Logical empiricism and Pure theory of law – Family resemblance

The dualism of is-ought is one feature in common between the Vienna Circle and the school of Pure Theory of Law of Hans Kelsen, who in his later life in the USA converged with the Unity of Science movement and contributed with a volume on *Vergeltung und Kausalität* (Retribution and Causality) 1940 (*Society and Nature* 1943) in the series "Library of Unified Science".[68]

This family resemblance and overlapping intentions in the context of Viennese modernity and afterwards are a becoming closer in exile as in Vienna till 1931, where Kelsen developed his law theory inspired by Kant, Freud, and partly Husserl in the frame of a anti-metaphysical enlightened world view fighting against any variant of totalitarian ideology and politics like most members of the Vienna Circle, as Gustav Bergmann has formulated already in 1938.[69]

Although Kelsen in his posthumous published *Allgemeine Theorie der Normen* did not share Schlick's moral philosophy from a legal point of view, the problem of the foundation of last normative principles from a neo-Kantian perspective, the relation of law and morality viz. normative and descriptive statements stayed on the agenda of a common attitude towards science and society as expressed also in Kelsen's posthumous edited volume on *Secular Religion.*[70]

67 Recently published by Anne Siegetsleitner (Ed.) (2010) *Logischer Empirismus, Werte und Moral. Eine Neubewertung*, Wien–New York: Springer.

68 Clemens Jabloner (Ed.) *Logischer Empirismus und Reine Rechtslehre*, Wien–New York: Springer.

69 As a source and research basis see the publications of the Vienna based Hans Kelsen Stiftung: www.hans-kelsen.org. Regarding the Bergmann reference: Gustav Bergmann, "Erinnerungen an den Wiener Kreis. Brief an Otto Neurath", in: Friedrich Stadler (Hrsg.), *Vertriebene Vernunft II. Emigration und Exil österreichischer Wissenschaft 1930–1940*. Münster: LIT Verlag 2004, S. 171-180.

70 Hans Kelsen, *Secular Religion. A Polemic against the Misinterpretation of Modern Social Philosophy, Science and Politics as "New Religions"*. Ed. from the estate of Hans Kelsen by Robert Walter, Clemens Jabloner and Klaus Zeleny. Wien–New York 2012.

19 Felix Kaufmann's mediating schools and methods – liberalism and pluralism

Felix Kaufmann (1895–1949) was a unique mediator between some important Viennese intellectual circles: based on a lifelong commitment to Husserl's phenomenology, he commuted between Kelsen's theory of law, the Ludwig von Mises seminar linked to the so called "Geist-Kreis" of the Austrian School in economics (F. A. Hayek), and the the Schlick-Circle bridging the gap between iurisprudence, the social and cultural sciences (reconciling *Erklären* und *Verstehen*) mainly via methodological studies: his main work on *Methodenlehre der Sozialwissenschaften* (1936) is a convincing attempt to overcome the ongoing *Methodenstreit* in the social sciences since the end of the 19th century.

In addition, he contributed to the unresolved foundational debate in mathematics, e.g., with his book *Das Unendliche in der Mathematik und seine Ausschaltung* (1930), published one year before Kurt Gödel's proofs, arguing for an intuitionist conception inspired by Husserl's philosophy of mathematics.[71]

Although not a philosopher at the University (he had to earn a living as manager of the Anglo-Iranian Oil Company), Kaufmann only in exile after 1938 succeeded at the New School for Social Research in New York – together with his Viennese friend Alfred Schütz – with an academic career till the end of his too short life. In the US Kaufmann tried to approach American (neo)pragmatism, especially Dewey, who was not really convinced of a theoretical alliance between Logical Empiricism and (neo)pragmatism – even if himself a contributed to the International *Encyclopedia of Unified Science* (with "Theory of Valuation"). Therefore, Kaufmann did not only translate his 1936 book, but wrote a new one, although under the same title *Methodology of the Social Sciences* (1944), the former one pleasingly to be reprinted soon in the "Vienna Circle Collection".[72]

Generally, Kaufmann provided a merger of liberalism und pluralism in a phenomenological (later also pragmatist) perspective on scientific philosophy, even if the fusion between Logical Empiricism and pragmatism failed because of the reluctance of Dewey, Nagel and others. From a present day point of view his attempts, especially as a co-editor of the journal *Philosophy and Phenomenological Research,* are significant building blocks for a methodological approach to different philosophical positions overcoming the dualisms of "continental" and "analytic" schools – by the way, defending the Kantian heritage against the ac-

71 Felix Kaufmann, *Das Unendliche in der Mathematik und seine Ausschaltung*. Leipzig-Wien 1930. (Darmstadt 1968). Expanded English Edition: *The Infinite in Mathematics*. With an Introduction by Ernest Nagel. Ed. by Brian McGuinness. Dordrecht-Boston-London: Reidel 1978.

72 Felix Kaufmann (1944) *Methodology of the Social Sciences*, Oxford (New York 1958). Reprint of the *Methodenlehre der Sozialwissenschaften* (1936): *Theory and Method in the Social Sciences*. Ed. by Robert S. Cohen and Ingeborg Helling. With an Introductory Essay by Ingeborg K. Helling. Springer (forthcoming).

cusations of Dewey's critique in his *German Philosophy and Politics*[73]. His premature death prevented an adequate appreciation and critical evaluation of his impressive work, which is complemented by his humour and (self)irony as documented in his posthumously published songs on economy and philosophy.[74] His methodological strategies similar to P. W. Bridgman's operationalism with decision theoretical rules are developed further by the Isaac Levi and Henry Kyburg.[75] Not to forget, that Karl Popper succeeded with his *Poverty of Historicism* in the Cold War period, in which he took over directly Kaufmann's pro-naturalistic and anti-naturalistic doctrines applied to his concept of historicism, without mentioning him explicitly in this regard.[76]

20 Philosophical foundations of quantum physics and mathematics

From the beginning in the first Vienna Circle modern physics was the challenge for the conceptualization of a "scientific philosophy": Mach, Einstein, Russell and Bohr were the most appropriate research subjects as addressed by Philipp Frank, Hans Reichenbach and Moritz Schlick and the philosophical interpretation of modern (quantum) physics and relativity theory.[77] Especially Schlick's *Raum und Zeit in der gegenwärtigen Physik* (Space and Time in Contemporary Physics 1919/2006) – together with Schlick's main work *Allgemeine Erkenntnislehre* (*General Theory of Knowledge* 1918/1925) was appreciated by Einstein as the best philosophical interpretation of his relativity theory, even if since the middle of

73 Peter M. Ruttkoff/William B. Scott, *New School. A History of the New School for Social Research*. New York 1986, 137f., with reference to John Dewey's, *German Philosophy and Politics*. (1915). German translation: *Deutsche Philosophie und Deutsche Politik.* With an introduction by Axel Honneth. Berlin 2000.

74 Felix Kaufmann, *Wiener Lieder zu Philosophie und Ökonomie*. Mit einer Einführung von J. Herbert Fürth. Hrsg. von Gottfried Haberler und Ernst Helmstädter. Stuttgart–Jena–New York: Gustav Fischer Verlag 1992. On the life and work of Felix Kaufmann: Harry P. Reeder, *The Work of Felix Kaufmann*. Washington, D.C. 1991; *Klarheit und Methode: Felix Kaufmanns Wissenschaftstheorie*. Amsterdam–Atlanta 1990; Friedrich Stadler (Ed.) (1997) *Phänomenologie und Logischer Empirismus. Zentenarium Felix Kaufmann*. Wien–New York.

75 H. G. Zilian (1990) *Klarheit und Methode: Felix Kaufmanns Wissenschaftstheorie*, Amsterdam: Rodopi, p. 11.

76 Malachi Hacohen, *Karl Popper – The Formative Years*, 1902–1945. *Politics and Philosophy in Interwar Vienna*. Cambridge University Press 1997, 362ff.

77 See the related volumes of the Schlick edition: *Raum und Zeit in der gegenwärtigen Physik*, Moritz Schlick Gesamtausgabe, Abt. I, vol. 2, p. 121-345 and the Reichenbach Edition, Springer. Most important the writings of Philipp Frank, besides his biography of Einstein: *Das Kausalgesetz und seine Grenzen,*Vienna, 1932. *Between Physics and Philosophy, Science and its Philosophy*, Cambridge, Mass., 1941; *Foundation of Physics*, Chicago, 1946 and *Relativity – A Richer Truth*, Boston, 1950.