

Reviews

Günther Sandner, *Otto Neurath. Eine politische Biographie.* Vienna: Paul Zsolnay Verlag, 2014

Otto Neurath—who needs no introduction to readers of this Yearbook—lived a life that was anything but uneventful. Moreover, it was played out in far more than one professional arena. The biography under review by Günther Sandner is not the first. Besides his son Paul Neurath’s highly informative biographical sketch that observed disciplinary neutrality, we have to date Karola Fleck’s early study that focused upon the making of the philosopher and two more recent ones that tell his intellectual biography in terms of a series of interdisciplinary foundational debates, but again with an eye primarily to the philosopher.¹ Sandner’s highly readable biography differs from these, first of all, in being of monograph length and, second, in focusing upon Neurath as a political thinker—that is, “political” in rather general terms. This affords the advantage of considering aspects of Neurath’s life and activity that found little discussion in his philosophy as such, but nevertheless were formative early on or decisive for his later development. Therein lies the strength of this book. And since Neurath was, without doubt, the most political animal among the logical positivists, whatever we can learn here will also inform our view of this expressly holistic thinker as a philosopher. But those conclusions are left for the reader to draw.

¹Paul Neurath, “Otto Neurath (1882–1945). Leben und Werk” in P. Neurath, E. Nemeth (eds.), *Otto Neurath oder die Einheit von Wissenschaft und Gesellschaft*, Vienna: Böhlau, 1994, 13–96. (A shorter English version is “Otto Neurath (1882–1945). Life and Work” in E. Nemeth and F. Stadler (eds.), *Encyclopedia and Utopia. The Life and Work of Otto Neurath*, Dordrecht: Kluwer, 1996, 15–28.) See also Karola Fleck, *Otto Neurath. Eine biographisch-systematische Untersuchung*. University of Graz, 1979, rev. and trans. in N. Cartwright, J. Cat, K. Fleck, T. Uebel, *Otto Neurath. Philosophy Between Science and Politics*, Cambridge: Cambridge University Press, 1996, 7–88; T. Uebel, “Otto Neurath—Leben und Werk”, in *Internationale Bibliographie zur österreichischen Philosophie* Bd. 10: 1991/1992, Amsterdam: Rodopi, 2005, 7–52, and J. Cat, “Otto Neurath”, in E. Zalta (ed.), *The Stanford Encyclopedia of Philosophy*, internet, 2011 (<http://plato.stanford.edu/archives/win2011/entries/neurath>).

Consider “The Young Neurath” (Ch. 1). Apart from presenting the roles of his father Wilhelm Neurath and of the sociologist Ferdinand Tönnies and from allowing us to engage with three very expressive photographs—one as a bright and prepossessing schoolboy, one as an optimistic youth in a group with a happy Popper-Lynkeus (one of his heroes) and his father Wilhelm looking on quizzically (a truly prophetic picture), and one with his first wife Anna Schapire and her sister Rosa (who was to become a well-known art historian)—here we learn of an element of Neurath’s world which on reflection may readily appear presupposed but was rarely if ever topicalized as such. That is his engagement with turn-of-the-century feminism, first in correspondence with the then popular if controversial Swedish author Ellen Key, then with the work and person of his wife Anna who published on the history of the women’s movement and the ongoing struggle for women’s rights in the work place. Anna was responsible, so Sandner, for impressing upon Neurath the importance of the so-called women’s question. Another interesting issue raised by Sandner is the role that his Jewish identity may have played in his early life (as opposed to later on). Where some commentators pointed out that in many ways Neurath’s background was typical for children of the first generation of emancipated Austro-Hungarian Jews, Sandner points out that his father had converted to Catholicism, his mother was a German-born Protestant and Otto himself had been baptized according to Catholic rites. The apparent blindness to anti-semitic passages in Marlowe’s *Faust* which Neurath edited in 1906 certainly contrasts with the awareness of racial stereotyping that in the years of his English exile in the 1940s he planned to analyze historically in a book-length study of toleration (but never completed).

Chapter 2, “The Teacher of War Economics”, turns to Neurath’s pre-World War I academic career. His work at the New Viennese Commercial Academy from 1907–1914 laid the basis for his life-long interest in civic education (in economics, political and social science) attested also by numerous publications at the time. Meanwhile war economics, the study of the transformation of national economic life under war conditions, became his professional specialization. Here we learn previously unknown details about Neurath’s service during World War I in the Austrian War Ministry as a group leader of its “Scientific Committee” (with the post-war Austrian Foreign Secretary Otto Bauer working under him) that was collecting and systematizing statistical material, and about a somewhat parallel effort towards the foundation of a Museum for War Economics in Leipzig in 1918. Neurath’s concerns in the Vienna ministry and the Leipzig museum were of a scholarly rather than nationalist nature and so far his party-political position remained indeterminate. From 1908 Neurath had been writing for the periodical *Kunstwart* (which was distinctly anti-socialist before the war, unlike after the German revolution when Neurath used it as a forum for his socializations plans) and in 1917 he was an invited speaker in one of the cultural congresses at Burg Lauenstein addressing alongside Max Weber the leadership of the sometimes politically ambivalent German Youth Movement (to the left wing of which belonged his later philosophical colleagues Carnap and Reichenbach). By 1919, Neurath had joined the Social Democratic Party and took up a highly exposed (which he described in retrospect as merely

administrative) in the Bavarian revolution as chief of its central economic office overseeing its socialisation efforts. In consequence his accreditation as university teacher in Heidelberg, awarded only 2 years previously, was withdrawn—ending his academic career.

Chapter 3, “Vita Activa: Total Socialization”, deals with the ideas and plans that propelled Neurath into public consciousness: his advocacy, promulgated by numerous articles and pamphlets, of efforts to organize the national economy by central planning according to the principle of production for social need rather than capitalist profit. Sandner provides general background, outlines Neurath’s scheme, describes the stages that led to his appointment in Munich and the subsequent post-revolutionary imprisonment, and notes both the democratic potential of Neurath’s plans and the well-known criticisms of their practical shortcomings. What’s new here concerns mainly the protracted negotiations that led to Neurath’s extradition to Austria (allowing him to avoid the lengthy jail sentence he had received), his brief relations with the industrialist, political author and later German Foreign Secretary Walter Rathenau (murdered by anti-Semites in 1922), and the circumstances of his production of a socialization pamphlet for a “Jewish planned economy in Palestine”. While the analysis of Neurath’s socialization plans generally and of the criticisms they received does not go far enough to allow readers to see why they differ significantly from the planned economies that history did, after all, bequeath on Eastern Europe and Asia, Sandner is correct to note this.

In Chap. 4 we find Neurath back in the now republican Vienna, ruled by the Social Democrats who retained the city administration into the 1930s although the rest of Austria already in the early 1920s fell back to conservative parties (putting an end even to the modest Austrian efforts at socialization). Besides his commitment to workers’ education throughout the period, Neurath’s involvements reached from the short-lived Institute for Communal Economy and the urban settlement movement in the early 1920s to his role in the Austrian Werkbund (an association of artists, architects and designers) in the later 1920s and CIAM’s 1933 architects’ congress in Athens. Most important, however, were the founding of his innovative Social and Economic Museum with its internationally applauded method of pictorial statistics and, last but not least, his role in the Vienna Circle. Sandner largely confirms what is already known but adds numerous personal and institutional details that provide local color and so successfully conveys the dense networks created by Neurath.

Chapter 5 considers Neurath in emigration: first the new start of his museum’s picture-statistical work in Holland and its expansion to the USA and the organizational work for the unity-of-science congresses from 1934 to 1939 and the International Encyclopedia project with University of Chicago Press, then his second flight in a small fishing boat to England and his restart of his work there with Marie Reidemeister (soon to become his third wife) and with the documentary filmmaker Paul Rotha. Neurath was much concerned with the question of the re-education of the population of the soon to be defeated German Reich and he participated in the debates about the democratic standing of Plato’s conceptions of the state (discussions that had been prompted long before Popper, we may add, by the Oxford don and later Labour politician Richard Crossman). Not without interest

is Sandner's finding that Neurath intentionally kept his distance from the political infighting amongst the Austrian emigrées.

What then, finally, about Neurath's politics? Many remain puzzled by the picture-statistical work he and his team did in Moscow from 1931 to 1934 for the publication of the results of the first 5-year plan and of projections for the second one. Sandner writes that Neurath's view of the Soviet experiment in communism, which in the early 1920s he had regarded "not without sympathy" (227), markedly "deteriorated" (232) in light of his experiences there. What had attracted him originally was the opportunity to participate in an actual attempt to refashion a national economy—which he was led to regard as far more successful than it was—but throughout his engagement in Moscow (which was sanctioned by the Austrian Social Democrats who at home refused cooperation with communists) he stuck to his own ideological position as a democratic socialist which there was much disparaged. (Criticisms of the Soviet Union which Neurath voiced later alienated former friends like the architect Schütte-Lihotzky). His picture-statistical involvement apart, Neurath's position does not therefore seem to have differed much from that of many on the left in Western Europe in the early 1930s.

It is in his 1928 monograph partially translated as "Personal Life and Class Struggle" that Sandner locates the "key text for understanding the political Neurath" (211).² Sandner is undoubtedly right to stress as central Neurath's understanding of Marxism as "social Epicureanism", in contrast both to then current attempts to re-Hegelianize it (after its previous mechanization, as it were, by the German party orthodoxy), and to relate this understanding directly to Neurath's theory of life conditions which provided the systematic foundation of Neurath's socialization plans (as in his 1925 monograph *Economic Plan and Calculation in Kind*).³ It may be doubted, however, whether already by 1937 Neurath had given up on his hope for a socialist future, as Sandner tentatively suggests with regard to a paper published as part of an ill-fated attempt at cooperation with Horkheimer's Frankfurt Institute of Social Research. Further discussion of the political dimension of this particular episode (the overall dynamics of which Sandner judges correctly) would have provided, one suspects, a welcome opportunity to deepen our understanding of Neurath's take on Marxism up to then. By 1945, in any case, Neurath did distance himself from Marxism, as Sandner documents with reference to a letter to Josef Frank (the architect brother of his Vienna Circle colleague Philipp). In a manuscript from the same year that remained unpublished in his lifetime he summarized his later pluralist views on politics, education and scientific intervention in social processes.⁴ In his biographer's words: "Democracy meant for him the communication between experts and citizens on the same level. It meant the search, on the basis of

² See Neurath, *Empiricism and Sociology* (ed. by M. Neurath and R.S. Cohen), Dordrecht: Reidel, 1973, 249–298.

³ See Neurath, *Economic Writings* (ed. by T. Uebel and R.S. Cohen), Dordrecht: Kluwer, 2004, 405–465.

⁴ See Neurath, "Visual Education. Humanisation versus Popularisation" (ed. by J. Manninen), in Nemeth and Stadler, *op. cit.*, 245–335.

knowledge common to all, for a compromise that is acceptable to all affected. A decision of the majority against the minority represents only an exception, but not rule of democratic processes.” This is hardly a political *theory*, to be sure, but, as Sandner adds, this is “a substantive *approach* to the theory of democracy incorporating deliberative and participatory elements” (292, emphasis added). And he notes that in this letter to Frank Neurath admitted that the tensions between a central organization of the economy and individual freedom are not easily resolved—and had not been so to date.

Neurath’s life and work, Sandner suggests, was not only “a product of his time” but also a “formative influence on his time”, propelled by a philosophical-political program that “still today remains worthy of discussion” (297). His articulation of Neurath’s legacy focuses on the “democratization of knowledge” much-discussed nowadays and on the contribution his picture-statistical methods of communicating social facts can make to this. Sandner acknowledges Neurath’s mistakes concerning the separation of the science of political economy from politics itself, but notes that despite his failed prognoses in mid-life about the imminent advent of socialism in the West he also would never have regarded the end of state socialism as the “end of history”. Neurath’s criticism of undirected—certainly unchecked—capitalist expansion, irrespective of the limits of the planet or the needs of its population, finally, is judged justified more than ever today. In sum, Sandner’s biography admirably succeeds in making accessible Neurath’s life work across several disciplines by relating his seemingly disparate efforts to the humanistic utopianism at their core and provides a balanced assessment of his achievements.

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EINO KAILA, *Human Knowledge: A Classic Statement of Logical Empiricism*. Translated by Anssi Korhonen; edited by Juha Manninen, Ilkka Niiniluoto, and George A. Reisch. Chicago, Illinois: Open Court, 2014, pp. xxvii + 217

Eino Kaila (1890–1958) is one of the less well-known figures within the logical empiricist movement. Although there has been some research on his philosophical work in recent years, Kaila’s contribution to the logical empiricist project is still in need of closer examination. The present volume should prove as an excellent basis in this respect. In fact, Kaila’s *Inhimillinen tieto* is a classic of early/mid twentieth-century philosophy of science. It is therefore all the more important that the book is now available in the translation by Anssi Korhonen.

The volume comprises ten chapters and an introduction by the editors Juha Manninen and Ilkka Niiniluoto. As the editors point out in their introduction, Kaila conceived of his book (published in the Finnish original in 1939) both as a textbook

of scientific philosophy for laymen and as a systematic introduction to logical empiricism for professionals. Rudolf Carnap, with whom Kaila stood in close contact, welcomed Kaila's contribution especially for its paying attention to the "historical connections," since these, as Carnap admitted, were "mostly ignored" in the existing publications by the logical empiricists. Furthermore, Carnap suggested to publish the book in English translation for the *Library of Unified Science* which in turn was published, in the Dutch exile, by Otto Neurath. However, nothing came of Carnap's suggestion because Holland was soon occupied by German troops, Neurath had to flee to England, and Finland went to war against the Soviet Union in the summer of 1941. But how came it that Kaila had such splendid connections to the members of the Vienna Circle? Here, it must be seen that academic philosophy in Finland had for a long time been dominated by Hegelian idealism which, according to the editors, was represented by the "national philosopher" Johan Vilhelm Snellman (1806–1881). Kaila, even in his early years, was not at all attracted by idealism. Rather, he engaged in the philosophy of science, focusing on Machian positivism and its rejection of atomism. Kaila himself defended the reality of atoms and argued for their being part of a "mind-independent causal nexus." In 1926, he published his monograph *Die Prinzipien der Wahrscheinlichkeitslogik*, where he critically discussed both the views of probability of Edgar Zilsel and Hans Reichenbach. Herbert Feigl, in his 1927 dissertation *Zufall und Gesetz* (which was supervised by Moritz Schlick), critically evaluated Kaila's monograph. In 1929, Kaila (on invitation by Schlick) decided to visit Vienna in order to participate at some of the Vienna Circle's meetings. In the Circle's 1929 manifesto "Wissenschaftliche Weltauffassung – Der Wiener Kreis," Kaila was mentioned as one of the thinkers close to the "scientific world-conception" of the Circle. This had to do in the first place with Kaila's methodological orientation which implied that there is no sharp difference between philosophy and special scientific disciplines and that philosophy itself should proceed by making use of exact methods. However, as concerns questions of systematic outlook, Kaila, like Reichenbach, defended some sort of probabilistic realism, particularly against Carnap's declaration that the realism controversy is meaningless.

This brings us to the book's ten chapters which are tied together by one red thread, namely (the unifying idea of) *invariance*. More precisely, the book is subdivided in three parts. Part One deals with the problem of theory formation, Part Two with the formal truth of theories, and Part Three with the empirical truth of theories. Invariance plays an essential role in all three parts. However, it is especially Part One where Kaila develops his invariantist approach to science and scientific theory construction. As he declares in the preface, for him "the logical empiricist conception of knowledge is the culmination of two and a half millennia of development in human ideas" (xxvi). Yet, it must be seen that Kaila, by invoking invariance, contributed an own and very specific version of the logical empiricist conception of knowledge. Heavily inspired by Ernst Cassirer's *Substanzbegriff und Funktionsbegriff* (1910), Kaila characterized the aim of science as the "search for invariances" (3). By 'invariance' he meant something like regularity, or lawfulness; but he also meant by it the stability, or constancy, of physical entities like energy. On the whole, it is

invariances which, according to Kaila, are the object of both scientific and prescientific knowledge. Or, as he puts it at the beginning of Chap. 1: "As the invariances that we discover are more general, the more we succeed in satisfying our pursuit of knowledge." (ibid.) Thus there is a hierarchy of invariant systems ranging from everyday perceptual objects to the most stable and lawful objects of science. The outstanding characteristic of the objects of science is that they are *idealized*. According to Kaila, in science "we *round off* everything in thought" (10), that is, we "*rationalize* our concepts – for instance the concept of acceleration – to give them that exactness, precision, and simplicity that is not possessed by the corresponding phenomena of experience" (ibid.). Nevertheless, the search for invariances leads, according to Kaila, to substantive knowledge. Although it is not perceptual qualities which are grasped by scientific knowledge, we are in position to acquire knowledge of certain *structural features* which, in mathematized science, usually have the status of *isomorphisms*. It is for this reason that Kaila thinks that "it is wrong to say that we know *nothing* of things-in-themselves; after all we know their structure" (14).

Chapters 2, 3 and 4 reconstruct the historical development from the Greeks up to Galileo, Newton, and Leibniz. For Kaila, Galileo is the hero of this story. For it was Galileo who brought together the two decisive components of scientific knowledge: the search for invariances, on the one hand, and the requirement of verification, on the other. Whereas Aristotle raised the question 'What?' and accordingly looked for the substance, or essence, of things, Galileo raised the question 'How?' and accordingly looked for functions, or as Kaila alternatively puts it, "*relational invariances*" (51). Questions about essences were completely ignored by Galileo, which in turn, in Kaila's eyes, makes him "one of the forerunners of logical empiricism" (53). However, with Descartes, the empiricist impetus was rudely stopped: "This distinguished mathematician, despite being given the honorific title 'father of modern philosophy', was far behind Galileo in his conception of knowledge. In Galileo we find a fruitful balance between the search for invariances and the requirement of empirical verifiability. But with Descartes this balance tilts toward Plato and a postulate of invariance. Empirical verifiability, it is suggested, is not necessary in principle, for we are supposed to know the laws of nature in advance." (59) Unlike Galileo, Descartes, by raising the question 'Why,' was looking for 'ultimate causes' and thereby stepping back to Aristotelian essentialism. But then, Kaila rather dramatically declares, the "gigantic figure of Newton" (61) entered the stage. With Newton, the Galilean conception of knowledge got saved, that is, according to Kaila "Newton redirects the course of modern science, rescuing it at a moment when Cartesianism was leading it away from the right path" (61). By rejecting *a priori* speculative hypotheses about the essences of phenomena and their causes, Newton returned to the empirical basis of science. As early as in his *New Theory of Light and Colours* of 1671, Newton refused to answer Aristotelian and Cartesian *what-* or *why-*questions: "Science has no other task than to start from experience and state the exact laws of phenomena that will help other phenomena to be predicted. That famous slogan, 'Hypotheses non fingo,' is already presupposed in this first work." (62) With Leibniz, this whole development reaches its culmination. For, according to Kaila, it was Leibniz who, in terms of his "*principe de l'observabilité*, most

forcefully articulated the requirement of empirical verifiability. Thus, like Galileo and Newton, Leibniz – the alleged “radical rationalist” (67) – should be seen as a forerunner of the modern, i. e. logical empiricist, conception of knowledge.

Chapter 5 closes Part One by reflecting on the problem of induction and its relation to the concept of probability. As Kaila briefly indicates, the task of an ‘inductive logic’ in his view is illusory. For him, the probability that we assign to inductive generalizations is purely psychological. It has to do exclusively with the “way of discovery” (82), whereas logic is restricted to the “way of demonstration” (ibid.). Accordingly, an inductive *logic* would be a *contradictio in adiecto*.

Part Two of the book is subdivided in two chapters. Chapter 6 deals with logical truth, Chap. 7 with mathematical truth. As concerns logical truth, Kaila gives an instructive and very readable overview over the basic elements of modern first-order logic. He thereby draws on results provided by David Hilbert, Bertrand Russell, Ludwig Wittgenstein, and Alfred Tarski. Furthermore, he addresses Kurt Gödel’s work on the so-called decision problem and finally concludes that logical truths are “consequences of definitions” (120) and are therefore to be seen as analytical sentences. Interestingly enough, Kaila in this context anticipates certain ideas by W. V. O. Quine, claiming that “the analyticity and syntheticity of a sentence is a ‘relative matter’ that depends on how certain concepts have been defined” (116). As concerns *mathematical* truth, Kaila, at the end of Chap. 7, introduces what he calls “the first main thesis of logical empiricism” (136). What this thesis says is that the metalogical statements ‘Statement L is analytic’ and ‘Statement L is *a priori*’ are equivalent. The so-called second main thesis of logical empiricism says that every statement concerning reality must have real content. This in turn comes very close to what Carnap (in his “Testability and Meaning”) called the Principle of Testability. Kaila concludes Part Two by claiming that “Kant’s basic question, ‘How are synthetic *a priori* statements possible?’ is a mistake because there are no such statements.” (140) On Kaila’s own account only analytic statements are *a priori* and *vice versa*. Synthetic statements, on the other hand, are *a posteriori*, i.e., dependent exclusively on experience.

Part Three, which deals with empirical truth, is focused on such synthetic statements. At its very beginning, in Chap. 8, Kaila introduces the so-called third main thesis of logical empiricism, namely the Principle of Translatability which says that every theory (or set of theoretical statements) must be translatable into the language of experience. However, Kaila qualifies this principle by conceding that not every factual statement must be capable of a definitive verification (or falsification). He thereby criticizes the “radical positivist” (147) positions of Ludwig Wittgenstein and (especially) Moritz Schlick who, in his view, required that every factual statement be translatable to statements concerning ‘the given.’ Yet, in the further development of logical empiricism this radical view became liberalized by the weaker requirement of testability. As Kaila further points out, there is no empirical statement which is immune against revision. On the other hand, he goes not so far as to defend some sort of ‘coherence theory of knowledge,’ albeit “some extremists among the logical empiricists” (156), especially Otto Neurath, argued in favor of such a theory. On the whole, it remains somewhat unclear what Kaila’s own position

in this context amounts to. The best guess seems to be that he intends to defend some sort of Duhemian ‘holism,’ as regards the relation of theory and experience. At any rate, Kaila explicitly states that “[w]e must [...] give the principle of testability a broad interpretation, so that a theory in its entirety can be regarded as ‘one sentence’” (170). Furthermore, Kaila rejects all forms of metaphysics, understanding by ‘metaphysical’ a sentence which is intended as a factual sentence but does not have any experiential consequences. He directly criticizes Heidegger’s “essentialism” and “existentialism” and banishes it (in an overtly Carnapian manner) from the area of philosophy as “something like a lyrical outburst” (173). Chapter 9 deals with the “logic of physical theories.” It contains an interesting interpretation – and justification – of “micro-physical” theories. In Kaila’s view, “a sentence of a physical theory cannot be ruled out as ‘metaphysics’ solely on the grounds that it fails to depict any specific phenomenon of experience” (195). Rather, “[f]rom a logical point of view, there is nothing wrong with developing a micro-physical theory as far beyond the ‘threshold of observation’ as one may wish, in which case the theory will of necessity contain many sentences that cannot be tested in experience, as long as they are considered in themselves” (ibid.). Again, Duhemian holism, drives Kaila’s argumentation, thus anticipating Quine anew. The concluding Chap. 10 is devoted to what Kaila calls “logical behaviorism.” By ‘logical behaviorism’ he means the articulation of the following, so-called fourth main thesis of logical empiricism: Sentences about a subject’s immediate experience are equivalent to certain sentences about the states in the subject’s body. Simply put, Kaila in this connection recapitulates Carnap’s conception of the notorious mind-body problem. His position seems to be that of a ‘moderate physicalist.’ However, how the questions pertaining to the mind-body problem are to be answered is, according to Kaila, “for future experience to decide” (205).

Given the increasing interest in Kaila’s variant of logical empiricism, the present volume is a valuable source for scholars interested in the history of philosophy of science. Moreover, *Human Knowledge* deserves to be recommended to those who want to get a systematic overview over the principal tenets, claims and arguments of the logical empiricist project.

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Ernst Mach Studienausgabe: *Band 1: Analyse der Empfindungen* (hg. v. Gereon Wolters), Xenomoi Verlag, Berlin, 2008; *Band 2: Erkenntnis und Irrtum* (hg. v. Elisabeth Nemeth u. Friedrich Stadler), Xenomoi Verlag, Berlin, 2011; *Band 3: Die Mechanik in ihrer Entwicklung. Historisch-kritisch dargestellt* (hg. v. Gereon Wolters u. Giora Hon), Xenomoi Verlag, Berlin, 2012; *Band 4: Populär-Wissenschaftliche Vorlesungen* (hg. v. Elisabeth Nemeth u. Friedrich Stadler), Xenomoi Verlag, Berlin, 2014

Readers of this Yearbook need not be told of Ernst Mach's towering importance in the history of philosophy of science nor be reminded of his vast if controversial legacy. Giving notice here of the publication of the first three volumes of the *Ernst Mach Studienausgabe*—its first third—can amount, it might seem, to no more than giving notice of new bottles in which a famous old vintage is now available. Such notices can be useful in pointing fellow professionals to new teaching resources and directing fellow enthusiasts to purchases for personal consumption or for presents to those with a youthful interest in the subject matter. On this occasion, however, it must be stressed as well that the re-bottling has been expertly done.

In handsomely produced sturdy paperbacks we now find readily available *Band 1: Analyse der Empfindungen* (AdE, 1886), *Band 2: Erkenntnis und Irrtum* (EuI, 1905), and *Band 3: Die Mechanik in ihrer Entwicklung. Historisch-kritisch dargestellt* (MiiE, 1883), *Band 4: Populär-Wissenschaftliche Vorlesungen* (PWV, 1895). The numerous original steel engravings and illustrations, for instance, were digitalized individually for better reproduction, avoiding common failings of less careful republications. The texts too have been newly set—helpfully so with indications of original page breaks—according to the last edition authorized by Mach himself. Thus we get AdE in the form of the sixth edition of 1911, EuI in that of the second edition of 1906, MiiE in that of the seventh of 1912, and PWV in that of the fifth of 1923. Given the changes wrought by Ludwig Mach under the guise of supposedly verbal instructions for still later editions by his late father, this policy (followed for the entire *Studienausgabe*) is very well justified.

Each volume editor or team of volume editors—*Band 1*: Gereon Wolters, *Band 2 and 4*: Elisabeth Nemeth and Friedrich Stadler, *Band 3*: Gereon Wolters and Giora Hon—has performed tasks that become increasingly important as Mach's present recedes into our past. Not only have Mach's own sometimes incomplete or misleading bibliographic references in the original been corrected throughout, but numerous explanatory footnotes have been added. Clearly marked as such but integrated among the original footnotes below the relevant text, these notes serve a variety of purposes. Some explain what are now uncommon phrases of Mach's or what were then and now domain-specific concepts; others give biographical detail of the very many scientists mentioned by Mach often only in passing (many of them largely forgotten today except by specialist historians); others still provide further elucidation.

tion of some of Mach's sometimes overly succinct descriptions of the phenomena at issue or of related ones. With these editorial notes Mach's texts gain much in accessibility not only for first-time readers; indeed, re-reading them becomes a surprisingly refreshing experience.

Each volume also has an individual Preface by its editor/s which gives the background of Mach's intellectual biography against which the book should be read, outlines its publication history and presents the book's central thesis without undue scholastic clutter to stimulate the reader's interest.

Thus the Preface to *Band 1* wastes no time in on arguing against a misinterpretation that Mach's "home-spun" epistemology of science in *AdE* has often been subjected to—that of being a phenomenalist idealist—but instead sets out right away his "methodological naturalism" which regards human knowledge as best understood by the categories of the most advanced natural sciences that pertain directly to the subject (then it was sense-physiology to which Mach himself had made significant original contributions). Moreover, what may appear as mere sensationalist reductionism on the part of Mach is swiftly revealed as a neutral monism. For this monism the ideas of sensations and of bodily things, of mentality and materiality, are but different ways of conceiving the basic elements, ways that are constituted by the elements being regarded in different contexts of functional dependencies. As Quine might have put it disapprovingly, ontology is resolved into ideology, in the process rendering many a hoary old philosophical problem, as Carnap may have put it admiringly, into pseudo-problems.

In a similarly direct fashion *EoI* is placed by the Preface to *Band 2* right away in the context of the lecture series Mach gave in Vienna from 1895 to 1901 which were predominantly directed to different aspects of the history of the physical sciences but also to that of psychology and to the logic of scientific research. Readers are thus familiarized without delay with an interdisciplinary program of research that has points of contact, on the one hand, with the conventionalist approach to scientific theory-building of the French philosopher and historian of physics Pierre Duhem and, on the other, to the biologically oriented evolutionism of the Viennese philosopher and educationalist Wilhelm Jerusalem.

The Preface of *Band 3* introduces *MiiE* by way of citing Einstein's appreciation of Mach's "historical-critical" reflections on the progress of physics. This particular approach of Mach's was evident already in his earlier "On the History and Root of the Principle of the Conservation of Energy" and combines, as the editors show, a strong allegiance to empiricism with the agenda of anti-metaphysical enlightenment. Mach's empiricism is grounded in his pragmatic-evolutionary understanding of human cognitive functions which prompts, to begin with, the instinctive adaptation of thoughts to the facts of experience, which then is refined in the course of conscious reflection in scientific work by the adaptation of thoughts to each other. Anti-metaphysical enlightenment falls out quite naturally as an end product of these reflections.

The Preface of *Band 4*, the collection of shorter pieces which, incidentally, was first published in English by Paul Carus in America, fittingly features suggestive remarks on Mach's proximity to pragmatism—explicitly recognized by as such by

William James—and chronicles the collection's expansion across the five editions from 12 to 33 lectures to. Mach, it is rightly stressed, was master of the popular exposition of scientific subject matter without condescending moralizing or simplification.

Further volumes of the *Studienausgabe* will be the *Die Prinzipien der Wärmelehre*, *Die Prinzipien der Optik* and three volumes of shorter writings on physics, psychology and physiology, and history and philosophy of science. The great majority of Mach's works will thus be available again and, if the present volumes are a reliable guide, more accessibly so than ever. In sum then, the new bottles render the old wine more quaffable than ever—which is just as well another Mach centenary is nearly upon us!

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