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Carnap’s *Aufbau* and the Early Schlick

1 Introduction

In this paper I confine myself to merely giving a rough sketch. It is my aim to explore what kind of influence the early writings of Moritz Schlick might have exerted on Rudolf Carnap’s *Der logische Aufbau der Welt*. Usually, the story is told quite differently. Herbert Feigl, for example, reports that the later (Viennese) Schlick was influenced by Carnap. Feigl writes:

„Schlick’s *Allgemeine Erkenntnislehre* […] struck me like a thunderbolt. In the beautifully lucid and magnificently penetrating book Schlick argued essentially for a critical empirical realism, presenting trenchant objections to what he called the philosophies of immanence – that is, mainly the positions of Mach, Avenarius, and the early Russell. This, together with his views on the analytic nature of mathematical truth, his empiricist critique of Kant and the Neo-Kantians, and his profound understanding of modern science motivated me to become his student at the University of Vienna in 1922. But I was acutely distressed to witness Schlick’s conversion to positivism in the late twenties. This conversion was largely due to the influence of Carnap and Wittgenstein.“ (Feigl [1963] 1981, p. 39)

In what follows it will be shown that Schlick was not at all ‘converted’ by Carnap (in the case of Wittgenstein, to be sure, the situation was another one). Rather, it was Carnap who, at least to some extent, stood under the influence of Schlick. But the Schlick who played that influential role wrote in middle and late 1910s. In other words, it was the early (pre-Viennese) Schlick who, in certain respects, inspired Carnap’s *Aufbau*.

2 Schlick’s proposal: “Der logische Aufbau der Welt”

The most obvious – and at the same time most superficial – influence has to do with the title of Carnap’s book. Carnap himself had decided for ‘Konstitutionstheorie’ (see Mormann 2000, p. 87) but this, Schlick thought, was a bad idea. Thus, in the correspondence between Carnap and Schlick we find an extended exchange concerning the book’s title. The first relevant letter in this connection is from Schlick to Carnap, dated March 14, 1926. In that letter, Schlick points out that the title is “not very practically chosen”, since it could also be the title of a chemistry or medicine book. A more philosophical title would be more practical. So, Schlick proposes, “What about ‘Der logische Aufbau der Welt’?”[[1]](#footnote-1) Carnap’s reaction was reservedly positive. In a letter dated March 19, 1926, he told Schlick that he intends to put the title thusly: “Der logische Aufbau der Welt. Versuch einer Konstitutionstheorie der Begriffe.” Nevertheless, he was not sure if this will be his final decision.[[2]](#footnote-2) In a letter, dated December 1927 (written in Davos), Carnap makes explicit why he is still doubtful concerning Schlick’s proposal: ‘Der logische Aufbau der Welt’ would be apt for another book project he is planning, namely the exposition of a constitutional system with a physicalist (or materialist) basis. The system of the present work, however, has a phenomenalist basis and is accordingly concerned with the logical structure of *cognition*. Something like ‘Erkenntnislogik’ or ‘Der logische Aufbau der Erkenntnis’ would therefore be better suited.[[3]](#footnote-3) However, Schlick insisted on ‘Der logische Aufbau der Welt.’ In a letter dated January 4, 1928 (written in Kitzbühel), he hinted at the ‘suggestive force’ of book titles in general and made clear that ‘Der logische Aufbau der Welt’ would be the ideal solution in this respect. By this title, the intended “principled foundation” would be signified most adequately.[[4]](#footnote-4) As a matter of fact, Carnap followed Schlick’s advice and the book was published with the title ‘Der logische Aufbau der Welt,’ albeit without the intended subtitle ‘Versuch einer Konstitutionstheorie der Begriffe’.[[5]](#footnote-5)

It is worth mentioning that Schlick reviewed Carnap’s book in a very favorable light. The review appeared 1929 in volume 17 of the prestigious German journal *Die Naturwissenschaften*, stressing the “unique” character of Carnap’s contribution (see Schlick 1929, p. 550). As Schlick correctly observed, ‘Der logische Aufbau der Welt’ stood in the tradition of Leibnitz’s *mathesis universalis*. Its originality had to be seen in the application of modern logic and the resulting successful repudiation of metaphysical ‘pseudo-problems’ (see *ibid.*, pp. 550-51). In short, Schlick was really pleased with Carnap’s book. But does that mean that he became ‘influenced’ by it? Does it mean that Schlick was, as Feigl claims, ‘converted’ by Carnap and his ‘constitutional point of view?’ As will be shown in the following sections, it was rather the other way round: Carnap benefited from certain insights he could find in Schlick’s early, pre-Viennese writings. The Viennese Schlick, on the other hand, welcomed Carnap’s contributions, to be sure, but at the same time kept distance to most of their central systematic claims.

3 The Early Schlick’s ‘Critical Realism’

According to Michael Friedman, the early Schlick’s philosophical position is best characterized as that of a ‘structural realist.’ Friedman writes: “Schlick was not a positivist or strict empiricist in 1918, but a neo-Kantian or ‘critical’ realist – his viewpoint is perhaps best described as a form of ‘structural realism’.” (Friedman 1999, p. 20) I agree: Rather than being a follower of Comte or Mill, the early Schlick, and especially his *Allgemeine Erkenntnislehre* from 1918, stood in the Kantian tradition. The issue of ‘structural realism’ will be readdressed in the next section. For the time being, however, it is important to understand, what Friedman means when he characterizes the early Schlick as a ‘*critical* realist.’

To begin with, critical realism can be regarded as an autonomous current in what might be called *transcendental revisionism*. By ‘transcendental revisionism’ I mean the late nineteenth, early twentieth-century attempts to reconcile the original Kantian epistemological doctrine with the developments of modern mathematics (the advent of non-Euclidean geometries, in the first place) and modern physics (the advent of relativity theory, in the first place).[[6]](#footnote-6) There were, to put it bluntly, two dominant versions of transcendental revisionism in late nineteenth-, early twentieth-century philosophy in the German-speaking area. There was, on the one hand, the sort of critical (or ‘logical’) idealism, as it was primarily defended by the members of the so-called Marburg school of Neo-Kantianism (Hermann Cohen, Paul Natorp, Ernst Cassirer). According to the critical idealist agenda, it was the Kantian conception of the *A Priori* which stood in need of revision. The respective revisionary idea of a ‘relativized’ *A priori* has been widely discussed in recent scholarship (see, for example, Ferrari 1994, Friedman 1994 und 2001, Ryckman 2005). However, critical idealism was not the only revisionary project. The (nowadays less-known) current of critical *realism* aimed at a revision of the Kantian theory of knowledge as well. Yet, according to the critical realist agenda, it was not the Kantian conception of the *A Priori* but rather the Kantian conception of ‘things-in-themselves’ (*Dinge an sich*)that stood in need of revision. More precisely, critical realism was *critical* insofar as it reflected on the preconditions of scientific knowledge, thereby contributing to the more comprehensive project of a ‘scientific philosophy’ (*wissenschaftliche Philosophie*).[[7]](#footnote-7) Furthermore, critical realism was *realistic* insofar as it assumed the knowability of Kantian things-in-themselves. Painting with a rather broad brush, Erich Becher, one of the defenders of critical realism, straightforwardly *defined* realism as “the doctrine that things-in-themselves are knowable” (Becher 1914, p. 69). It was this ‘knowability thesis’ which distinguished critical realism from its idealist revisionary counterpart.

It is impossible in so short a space to go into the details of the critical realist program.[[8]](#footnote-8) Suffice it to notice that it was a quite widespread point of view around 1900. Thinkers such as Wilhelm Wundt (1832-1920), Alois Riehl (1844-1924), Gustav Störring (1860-1946), Oswald Külpe (1862-1915), August Messer (1867-1947), Willy Freytag (1873-?), Max Frischeisen-Köhler (1878-1923), Berhard Bavink (1879-1947), Victor Kraft (1880-1975), the already mentioned Erich Becher (1882-1929) and Aloys Wenzl (1887-1967) subscribed to the critical realist agenda. It is noteworthy that many of them were psychologists (namely Wundt, Störring, Külpe, Messer, and Becher). Moreover, it should be seen that the knowability thesis was not at all compatible with the original Kantian doctrine: According to Kant, things-in-themselves are definitely beyond the scope of theoretical knowledge.[[9]](#footnote-9) However, critical realism was not intended as an exegetical project. Rather, its principal aim was to ‘update’ the Kantian theory of knowledge in the face of the developments of modern science. The knowability thesis was a case in point: Findings both in pure geometry and in experimental psychology (see, in this connection, especially Külpe 1893) seemed to prove that the role of sensible intuition was largely overestimated by Kant.[[10]](#footnote-10) By severely downgrading its epistemic impact the way to a purely conceptual cognition of things as they are in themselves seemed to be free.

Given these preliminary remarks, we are now in a position to shed some light on the early Schlick’s approach toward the critical realist agenda. To be sure, Schlick never spoke of himself as a ‘critical realist.’ But it is more than obvious that he shared the critical realists’ programmatic core assumptions. Thus, in his 1915 article on ‘The Philosophical Significance of the Principle of Relativity’, he emphatically praised Kant’s critical method and its extension to the revolutionary developments in modern physics. Schlick writes:

We have known since the days of Kant that the only fruitful method of all theoretical philosophy consists in critical inquiry into the ultimate principles of the special sciences. Every change in these ultimate axioms, every emergence of a new fundamental principle, must therefore set philosophical activity in motion […]. [T]he Kantian Critical Philosophy may itself be regarded as a product of the Newtonian doctrine of nature. It is primarily, or even exclusively, the principles of the exact sciences that are of major philosophical importance, for the simple reason that in these disciplines alone do we find foundations so firm and sharply defined, that a change in them produces a notable upheaval, which can also acquire an influence on our world-view. (Schlick [1915] 1979a, p. 153)

Einstein’s principle of relativity was, according to Schlick, a paradigm case in this connection. In a certain sense, Einstein played a similar role for Schlick as Newton did for Kant. As is well known, Schlick, not at least because of his seminal Space and Time in Contemporary Physics (19171, 19182, 19203, 19224), became one of the most influential philosophical interpreters of Einstein’s theory of relativity. The following assessment by Michael Friedman should therefore be taken very seriously:

In 1922, largely on the strength of his work on the philosophical significance of the theory of relativity, which had been enthusiastically endorsed by Einstein himself, Schlick was named to the Chair for the Philosophy of the Inductive Sciences previously occupied by the scientists Ernst Mach and Ludwig Boltzmann at the University of Vienna, where he became the leader and guiding spirit of what we now know as the Vienna Circle of logical positivists. We might say, in this sense, that Schlick was the very first professional scientific philosopher. (Friedman 2012, p. 2)

So Schlick joined in with the critical realists’ – but also critical idealists’ – promotion of the idea of a scientific philosophy (for further details, see Neuber 2012, pp. 60-67).

What is more important, though, is that Schlick endorsed the critical realists’ knowability thesis. The most explicit articulation of this endorsement can be found in his 1919 article “Erscheinung und Wesen.” There, Schlick declares:

[T]he only natural continuation of Kant’s theory of knowledge, to which his system points from various angles, lies not in the idealist but the realist direction, and we arrive at it by a revision of Kant’s utterances about the so-called thing-in-itself and its knowability. (Schlick [1919] 1979a, p. 282)

Moreover, Schlick also endorsed the critical realists’ degradation of the role of sensible intuition. To quote again from “Erscheinung und Wesen”:

Kant has uncritically presupposed that in order to know an object, an intuition of the object is ultimately in some way necessary. […] But in truth intuition gives us no knowledge whatever; it is wholly inessential for this purpose. It provides, to be sure, an acquaintance with objects, but never a knowledge of them. (ibid.)

As a consequence, Schlick ends up with a conception of scientific knowledge as purely conceptual knowledge. His theory of ‘implicit definitions’ and the corresponding account of cognition as ‘unique coordination’ (eindeutige Zuordnung) sets the stage for the elaboration of this conception (see, for further details, Ryckman 1991 and Neuber 2012, pp. 70-77).[[11]](#footnote-11)

All of this indicates that Schlick and the critical realists were allied in some sense. However, there were also differences. The most obvious difference is that Schlick did not join in with the critical realists’ predilection for a ‘substantialist’ view of scientific objects.[[12]](#footnote-12) Instead, he argued in terms of a ‘relationalist’ point of view. Thus, in his Allgemeine Erkenntnislehre, Schlick points out:

[A]n object is always a complex of relations. These relations, on Kant’s theory, are not immediately given, but must be charged to the account of thought, judgments and concepts. According to the Criticist view, therefore, relations originate in judgments, whereas according to our concept of knowledge judgments are simply correlated with relations, which exist outside of this correlation. (Schlick [1918] 1974, p. 360)

Thus, for Schlick, relations (and not substances) have the status of things-in-themselves. They exist independently of our knowledge of them but are at the same time knowable by means of unique conceptual coordination.

This is not the place to go into the details of Schlick’s relationalism. However, it should at least be mentioned that it was this relationalism that stood in the background of Schlick’s celebrated interpretation of Einstein’s theory of relativity (see, for further details, Neuber 2012, ch. 2). Furthermore, it can, as Friedman does, be claimed that it was Schlick who paved the way for current ‘structural’ realism. The view that an object is “always a complex of relations” comes pretty close to what James Ladyman calls ontic structural realism (see Ladyman 1998). However, it is far from clear if this was really what Schlick intended by taking the relationalist point of view. As a matter of fact, he thought of himself as an epistemologist, not as a metaphysician. Ontic structural realism, it should be noted, would imply (at least a ‘naturalistic’ brand of) metaphysics (see, in this connection, Ladyman and Ross 2007). Maybe, then, the Schlickian line of reasoning amounts to what Ladyman calls epistemic structural realism (see, again, Ladyman 1998). However, it is beyond the scope of the present paper to deliver a satisfying answer to this (rather intricate) question.

4 Schlick’s Influence on Carnap

So let us came back to Carnap and to the question to what extent he might have been influenced by the early Schlick. In Carnap’s autobiographical notice one can read the following: “Schlick’s important philosophical work has unfortunately not found the attention it deserves. His very first book (Erkenntnislehre, 1918) contains many ideas that anticipate the core of later, more elaborate and formalized developments by other authors.” (Carnap 1963, p. 21) It is more than plausible that Carnap himself was among these “other authors.” More concretely, Schlick anticipated essentially Carnapian ideas in the following three respects: (1) concerning the relation of definition and structure; (2) concerning the relation of the perceptual and the physical; (3) concerning the relation of “empirical” and “metaphysical” realism.

1. Structure and definition

In § 11 of the Aufbau, Carnap introduces the notion of “structural description” (Strukturbeschreibung), which, as he points out, forms part of the logic of relations and which, in § 14, is illustrated by the famous railway map example. In § 15, Carnap points out that by the method of structural description it becomes possible to attach concepts to empirical objects, whereby these very objects are determined first of all. This procedure, Carnap supplements, is akin to David Hilbert’s conception of definition by axioms (see Hilbert 1899) which in turn was generalized by Schlick in the context of his theory of ‘implicit’ definitions (see Schlick [1918], 1974, § 7). However, in contrast to both Hilbert and Schlick, Carnap insists that by the method of implicit definitions it is not individual objects but only classes of objects which become defined. His own, Carnap’s, procedure of structural definition, on the other hand, enables the definition of individual objects and thus requires more than merely analytical connections between concepts. It requires, in other words, the consideration of “empirical findings” and is therefore to be characterized as synthetic. (See also Carnap 1927, in this connection; further the reconstructions in Howard 1996, 156-161; Richardson 1998, pp. 43-47; Carus 2007, pp. 192-196).

Thus Carnap did not fully agree with Schlick’s account of implicit definitions. Nevertheless, it can be stated that ‘structuralism’ was the connecting link between the early epistemologies of Carnap and Schlick. According to Carnap, all statements of science are “structure statements” (Carnap [1928] 1968, § 16), and it is, Carnap maintains, structure alone that accounts for the quest for objectivity.[[13]](#footnote-13) In § 75 of the Aufbau, Carnap stresses the priority of “basic relations,” thereby referring the reader to Ernst Cassirer’s relationalist (or ‘functionalist’) account of scientific concepts (see Cassirer 1910). But he could also have referred the reader to Schlick who, in his Allgemeine Erkenntnislehre, categorically claims: “In the last analysis, all knowledge is a matter of relations and dependencies, not of things or substances.” (Schlick [1918] 1974, p. 285) As has been shown elsewhere (Neuber 2013), structure (viz. relation) is the common ground on which Carnap, Cassirer, and Schlick develop their early epistemological conceptions.

1. The perceptual and the physical

According to Schlick, the relation of the perceptual and the physical is of central epistemological interest. As he points out in his Allgemeine Erkenntnislehre, the physical must be conceived of as being “constructed” out of perceptual singularities (see Schlick [1918] 1974, § 31). This does not mean that Schlick is an ontological ‘constructivist’ in any philosophically serious sense. Quite the contrary: What Schlick intends to argue for is that the physical as such is completely independent from our conceptual system, that is, transcendent. Nevertheless, the conceptual system itself is built upon the singularities within our diverse perceptual fields. Objective knowledge is nothing but the unequivocal coordination between the thusly constructed conceptual system and the realm of transcendent physical objects. The method by which this coordination is effected, Schlick calls the “method of coincidences” (ibid, p. 272) which, in his view, “is of the greatest significance epistemologically” (ibid.).

Schlick’s method of coincidences (and its epistemological significance) is meanwhile well-explored territory (see, for example, Ryckman 1992, Friedman 1997 and 2002, Howard 1999, Pulte 2006, Seck 2008, pp. 142-144, Neuber 2012, pp. 108-126); but it is, at first sight, not so clear where the connection to Carnap’s Aufbau lies. However, by looking closer at the issue, it becomes obvious that Carnap was in fact acquainted with this method. Thus, in § 130 of the Aufbau, he remarks:

The problem of assigning tactile qualities to world points to which only visual qualities (colors) were originally assigned and, furthermore, the assignment of still other sensory qualities can also be formulated as the problem of the mutual correlation of the various “sense spaces”. This problem is discussed by Poincaré [Wert], Schlick [Raum und Zeit] 95ff. (Method of Coincidences) and Jacoby [Ontol.] (Carnap [1928] 1968, p. 201)

The mentioned contributions by Henri Poincaré and Günther Jacoby (a nowadays forgotten anti-Kantian ontologist) notwithstanding, it is important to take into consideration the passage from Schlick’s Space and Time in Contemporary Physics to which Carnap is referring here. What one can read in this passage is, among other things, the following: “It is obvious that in the first instance only the intuitional psychological spaces and times are given us; and we must inquire how we have, by starting from them, arrived at the construction of the objective space-time manifold.” (Schlick [1917] 1979a, pp. 261-62) The jargon of “construction” is well motivated: According to Schlick, the concept of physical – objective – space is generated by applying the method of coincidences, which correlates the diverse psychological – subjective – spaces of our respective perceptual fields. The empirical result of this application of the coincidence method is the purely quantitative, abstract four-dimensional scheme of relativistic physics, i.e., the Riemann-Minkowski-Einstein spacetime structure.[[14]](#footnote-14)

Now it is quite interesting to see that Carnap, in the Aufbau, argues along very similar lines. § 136 is titled “The World of Physics” and begins as follows:

The perceptual world is constructed through the assignment of sense qualities; from it we must distinguish the world of physics, where physical state magnitudes are assigned to the points of the four-dimensional number space. This construction has the purpose of formulating a domain which is determined through mathematically expressible laws. They are to be mathematically expressible in order to allow us to calculate certain elements from those other elements which determine them. Furthermore, the necessity of constructing the world of physics rests on the circumstance that only this world, but not the perceptual world […], can be made intersubjective in an unequivocal, consistent manner […]. (Carnap [1928] 1968, p. 209)

Nevertheless, Carnap, like Schlick in the context of his method of coincidences, realizes that the starting point for the construction of the physical world is always the perceptual world. Carnap writes: “The construction of the physical world, aside from the regularity to which it is to lead, is essentially determined through a special relation which holds between it and the perceptual world: this relation we want to call physicoqualitative correlation.” (ibid., p.210)

Yet in order to obtain objective knowledge, we must completely abstract from the peculiarities of our sense organs. We must, in other words, conceive of the world of physics in a purely quantitative – conceptual – way. Schlick’s method of coincidences can be regarded as Carnap’s model for thinking about the relationship of the perceptual world and the world of physics in the way he does.[[15]](#footnote-15) One might even go as far as to claim that the method of coincidences served as a blueprint for the entire constructionist project in the Aufbau. At any rate, it cannot be denied that Carnap’s project and Schlick’s method are strikingly close to each other (for a similar appraisal, see Friedman 1999, p. 43).

1. Empirical versus metaphysical realism

As we have seen, the early Schlick favored some sort of critical empirical realism, arguing along epistemological, non-metaphysical lines. Much the same can be said of Carnap and his argumentation in the Aufbau. Thus, in § 52 he points out:

The realistic language, which the empirical sciences generally use, and the constructional language have actually the same meaning: they are both neutral as far as the decision of the metaphysical problem of reality between realism and idealism is concerned. It must be admitted that, in practice, linguistic realism [sprachlicher Realismus], which is very useful in the empirical sciences, is frequently extended to a metaphysical realism; but this is a transgression of the boundaries of science […]. There can be no objection against such a transgression, as long as it influences only the mental representations which accompany the scientific statements; this transgression is objectionable only if it influences the content of the statements of science. (Carnap [1928] 1968, pp. 86-87)

To be sure, the early Schlick would not have used the term ‘linguistic realism.’ In the period of his Allgemeine Erkenntnislehre, he was still miles away from any form of ‘linguistic turn.’ Furthermore, it is sometimes rather difficult to decide whether Schlick argues consequently within the intended epistemological agenda. That is, Schlick is sometimes ‘more metaphysical’ than he seems to realize.

But these are only side aspects. The really interesting point is that Carnap accepts a certain form of realism and that he explicitly endorses Schlick’s interpretation of Kantian things-in-themselves and the assumption of their knowability. Since this might sound quite bold (if not absurd) in the face of the established view of Carnap as an anti-realist (see in this respect, for example, Friedman 2007), it is appropriate to quote the following passage from § 176 of the Aufbau:

If things-in-themselves are defined as real objects which are not given (as is done by Schlick [Erkenntnisl.] 179), then they must indeed be counted among the cognizable objects and thus must be placed within the domain of (rational) science and not within metaphysics; for then they coincide with the constructed real objects. (Carnap [1928] 1968, p. 284)

Admittedly, Carnap qualifies this remark by adding that “it seems to us that this definition is not very practical, since it deviates altogether too much from customary usage (ibid.)”. However, the deviation from “customary usage” notwithstanding, Carnap obviously accepts a certain interpretation of Kantian things-in-themselves. It is the interpretation delivered by Schlick in his Allgemeine Erkenntnislehre. In Schlick’s view, things-in-themselves (relations!) should be interpreted as real but not immediately perceived objects and not as the metaphysical – substantial – ‘bearers’ of the objects’ properties. The respective passage in the Allgemeine Erkenntnislehre is worth quoting in full length:

Now objects whose reality is asserted without their being directly given are called (in our meaning of the term) things-in-themselves. At any rate this is the meaning we wish to assign to the term from now on. It seems to me that this definition brings out most clearly the problem that attaches to the concept. In what follows, the reader should at no time forget that the expression ‘thing-in-itself’ is to be understood in the stipulated sense alone. (Schlick [1918] 1974, p. 195)

And Schlick continues:

The term [‘thing-in-itself’; MN] can indeed be taken in many other senses. For instance, we may, with Mach […] believe that it must mean something that is left over when we think of a thing with all of its properties removed. This we are not concerned with. When we plead for the existence of things-in-themselves, we are saying merely that we may speak of real objects without thereby meaning that they are, in our sense, “given” as objects to a subject. Thus we are not postulating a hidden, unknown “bearer” of properties, an “absolute” in some metaphysical sense. (ibid.)

The latter, ‘absolutist,’ understanding of things-in-themselves would indeed not be compatible with Carnapian ‘constructed objects.’ Rather, it would have to be placed in the ballpark of metaphysics and thus in “the extrascientific domain of theoretical form” (Carnap [1928] 1968, p. 284).

So Carnap, like Schlick, rejects the assumption of metaphysically absolute – substantial – things; but he explicitly allows the possibility of objects which are constructed but not immediately given and thus (in the Schlickian meaning) transcendent. This enables a distinction to be made between ‘transcendence’ in the sense of empirical realism and ‘transcendence’ in the sense of metaphysical realism.[[16]](#footnote-16) On the first reading, which both Carnap and Schlick embrace, transcendence would imply the assumption of independence from immediately given sensory data (perceptual qualities). Physical spacetime would be a good example in this respect. On the second reading, which both Carnap and Schlick reject, transcendence would imply the assumption of independence from all possible experience in favor of ‘substances’, ‘essences’, and related metaphysical obscurities. On the whole, the empirical realist reading leads more or less directly to Carnap’s closer determination of “empirically real objects” in § 177 of the Aufbau. According to this closer determination, empirically real objects (be they sensory objects or the theoretical objects of science)

* can be clearly distinguished from dreams, hallucinations, etc.;
* can be “intersubjectivized” (i.e., are intersubjectively accessible);
* are independent of being actually experienced;
* are integrated in a “physical causal chain” (i.e., are not deliberately changeable);
* enable predictions of future observable events.

For Carnap, empirical realism and his own “construction theory” agree in all these five respects. From the standpoint of the early Schlick, there would certainly be no objections to this.

A further (and last) remark concerning the rejection of metaphysics is in order. In the penultimate § 182 of the Aufbau, Carnap makes the following statement:

Some philosophers call metaphysics a such and such delineated area of (conceptual) science. In view of the fact that this word, through its historical past, contains for many a suggestion of the vague and speculative, it would be more appropriate not to call such areas of philosophy which are to be treated with strict scientific concepts “metaphysics”. (Carnap [1928] 1968, p. 295)

And Carnap adds: “Other philosophers use the name ‘metaphysics’ for the result of a nonrational, purely intuitive process; this seems to be the more appropriate usage.” (ibid.) Carnap mentions Henri Bergson’s Introduction à la métaphysique (1903) in this connection and points out that Schlick has given an “especially clear account” of the difference between this kind of ‘intuitive metaphysics,’ on the one hand, and true, i.e., purely conceptual knowledge, on the other. This is a very well-known issue. Suffice it to note that Schlick, as early as 1913, criticized the Bergsonian (as well as the Husserlian) conception of ‘intutive knowlegde’ as a contradictio in adiecto (see Schlick [1913] 1979a, p. 146; further Schlick [1918] 1974, p. 83).

5 Had Carnap Any Influence On Schlick?

By reading Carnap’s autobiographical notice one might come to the conclusion that Schlick, in consequence of his move to Vienna in 1922, radically changed his philosophical position. Thus, Carnap reports:

[Schlick] and Reichenbach, like Russell, Einstein and many of the leading scientists, believed that realism was the indispensable basis of science. I maintained that what was needed for science was merely the acceptance of a realistic language, but that the thesis of the reality of the external world was an empty addition to the system of science. Under the influence of our discussions, Schlick abandoned realism. (Carnap 1963, p. 46)

One should be careful here: Schlick never claimed that he had ever “abandoned realism.” Quite the contrary: As he points out in his essay “Positivism and Realism” from 1932, he still thinks that “empirical realism” is a viable position, namely one that is compatible with what he calls “coherent empiricism” (see Schlick [1932] 1979b, p. 283). What is ruled out by this compatibilist view is metaphysical realism, on the one hand, and radical positivism, on the other.

So, Feigl’s assertion of a Schlickian “conversion to positivism,” which we quoted at the beginning of the present paper, cannot be sustained. Moreover, the associated assumption that Carnap had any influence on Schlick’s change in points of view is far from plausible. Suffice it to think of the existence of two ‘wings’ within the Vienna Circle, with Carnap and Neurath on the ‘left’ wing and Schlick and Waismann on the ‘right’ (see Uebel 2004). In the context of the famous protocol-sentence debate, this schism became most evident (for the details, see Uebel 2007, ch. 10).

However, it would be false to conclude that the early and the Viennese Schlick coincided in terms of philosophical outlook. As can be easily reconstructed from his Viennese writings (both published and unpublished), the later Schlick was deeply impressed by Wittgenstein and especially by Wittgenstein’s conception of philosophy as an “activity” (see, for example, Schlick [1930] 1979b). Thinking of philosophy in that way, though, was flagrantly at odds with Carnap’s (Tarskian) conception of a meta-language. Yet, to go into the details of this issue would require a paper of its own.

References

Becher, Erich (1914). Naturphilosophie. Leipzig: Barth.

Bergson, Henri (1903). Introduction à la métaphysique. Paris: Alcan.

Carnap, Rudolf (1926). Physikalische Begriffsbildung. Karlsruhe: Braun.

Carnap, Rudolf (1927). “Eigentliche und uneigentliche Begriffe”, in: Symposion 1, pp. 355-374.

Carnap, Rudolf ([1928] 1968). The Logical Construction of the World; translated by R. A. George. London: Routledge.

Carnap, Rudolf (1963). “Intellectual Autobiography”, in: P. A. Schilpp (ed.), The Philosophy of Rudolf Carnap. LaSalle: Open Court, pp. 3.84.

Carus, André (2007). Carnap and Twentieth-Century Thought: Explication as Enlightenment. Cambridge: Cambridge University.

Cassirer, Ernst (1910). Substanzbegriff und Funktionsbegriff: Untersuchungen über die Grundfragen der Erkenntniskritik. Berlin: Bruno Cassirer.

Feigl, Herbert ([1963] 1981). “The Power of Positivistic Thinking”, in: Inquiries and Provocations: Selected Writings, 1929-1974; edited by R. S. Cohen. Dordrecht, Boston, London: Reidel, pp. 38-56.

Ferrari, Massimo (1994). “Cassirer, Schlick und die Relativitätstheorie. Ein Beitrag zur Analyse des Verhältnissis von Neukantianismus und Neopositivismus”, in: E. Orth and H. Holzhey (eds.), Neukantianismus: Perspektiven und Probleme. Würzburg: Königshausen & Neumann, pp. 418-441.

Friedman, Michael (1994). “Geometry, Convention, and the Relativized A Apriori”, in: W. Salmon and G. Wolters, Logic, Language, and the Structure of Scientific Theories. Pittsburgh: Pittsburgh University Press, pp. 21-34.

Friedman, Michael (1997). “Helmholtz’s Zeichentheorie and Schlick’s Allgemeine Erkenntnislehre: Early Logical Empiricism and Its Nineteenth Century Background”, in: Philosophical Topics 25, pp. 19-50.

Friedman, Michael (1999). Reconsidering Logical Positivism. Cambridge: Cambridge University Press.

Friedman, Michael (2001). Dynamics of Reason. Stanford: CSLI.

Friedman, Michael (2002). “Geometry as a Branch of Physics: Background and Context for Einstein’s ‘Geometry and Experience’”, in: D. Malament (ed.), Reading Natural Philosophy: Essays in the History and Philosophy of Science and Mathematics to Howard Stein on his 70th Birthday. Chicago: University of Chicago Press, pp. 193-229.

Friedman, Michael (2007). “The Aufbau and the Rejection of Metaphysics”, in: M. Friedman and R. Creath (eds.), The Cambridge Companion to Carnap. Cambridge. Cambridge University Press, pp. 129-152.

Friedman, Michael (2012). “Scientific Philosophy from Helmholtz to Carnap and Quine”, in: R. Creath (ed.), Rudolf Carnap and the Legacy of Logical Empiricism. Dordrecht, Heidelbergg, New York, London: Springer, pp. 1-11.

Hilbert, David (1899).Grundlagen der Geometrie. Leipzig: Teubner.

Howard, Don (1996).”Relativity, Eindeutigkeit, and Monomorphism: Rudolf Carnap and the Development oft he Categoricity Concept in Formal Semantics”, in: R. N. Giere and A. W. Richardson (eds.), Origins of Logical Empiricism. Minneapolis, London: University of Minnesota Press, pp. 115-164.

Howard, Don (1999). “Point Coincidences and Pointer Coincidences: Einstein on Invariant Structure in Spacetime Theories”, in. H. Goenner, J. Renn, J. Ritter, T. Sauer (eds.), The History of General Relativity: The Expanding Worlds of General Relativity. Boston: Birkhäuser, pp. 463-500.

Kant, Immanuel ([1787] 1998). Critique of Pure Reason; translated and edited by P. Guyer and A. Wood. Cambridge: Cambridge University Press.

Külpe, Oswald (1893). Grundriss der Psychologie: Auf experimenteller Grundlage dargestellt. Leipzig: Engelmann.

Külpe, Oswald (1912). Die Realisierung: Ein Beitrag zur Grundlegung der Realwissenschaften; vol. 1. Leipzig: Hirzel.

Ladyman, James (1997). “What is Structural Realism?”, in: Studies in History and Philosophy of Science Part A 29, pp. 409-424.

Ladyman, James and Ross, Don (2007). Every Thing Must Go: Metaphysics Naturalized. Oxford: Oxford University Press.

Mormann, Thomas (2000). Rudolf Carnap. München: Beck.

Neuber, Matthias (2011). “Zwei Formen des transzendentalen Revisionismus – ‘Wissenschaftliche Philosophie’ beim frühen Ernst Cassirer und beim frühen Moritz Schlick”, in: *Kant-Studien* 102, pp. 455–476.

Neuber, Matthias (2012). Die Grenzen des Revisionismus: Schlick, Cassirer und das ‘Raumproblem’. Wien, New York: Springer.

Neuber, Matthias (2013). “Treffpunkt Struktur – Cassirer, Schlick und Carnap”, *Archiv für Geschichte der Philosophie* 95 (2013), S. 206-233.

Neuber, Matthias (2014). “Critical Realism in Perspective – Remarks on a Neglected Current in Neo-Kantian Epistemology”, in: M. C. Galavotti, D. Dieks, W. J. Gonzalez, S. Hartmann, T. Uebel, Marcel Weber (eds.), *New Directions in the Philosophy of Science.* Dordrecht, Heidelberg, New York, London: Springer.

Pulte, Helmut (2006). “The Space between Helmholtz and Einstein: Moritz Schlick on Spatial Intuition and the Foundations of Geometry”, in: V. F. Hendricks, K. Jorgensen, J. Lützen, S. Pedersen (eds.), Interactions: Mathematics, Physics and Philosophy, 1860-1930. Dordrecht: Reidel, pp. 185-206.

Richardson, Alan (1997). “Toward a History of Scientific Philosophy”, in. Perspectives on Science 5, pp. 418-451.

Richardson, Alan (1998). Carnap’s Construction of the World. Cambridge: Cambridge University Press.

Ryckman, Thomas (1991). “Condition Sine Qua Non: Zuordnung in the Early Epistemologies of Cassirer and Schlick”, in: Synthese 88, pp. 57-95.

Ryckman, Thomas (1992). “P(oint)-C(oincidence) Thinking: The Ironical Attachment of Logical Empiricism to General Relativity (and Some Lingering Consequences)”, in: Studies in the History and Philosophy of Science Part A 23, pp. 471-497.

Ryckman, Thomas (2005). The Reign of Relativity: Philosophy in Physics 1915-1925. Oxford: Oxford University Press.

Schlick, Moritz ([1913] 1979a). “Is There Intuitive Knowledge?”, in: Philosophical Papers Vol. 1 (1909-1922); edited by H. L. Mulder and B. van de Velde-Schlick. Dordrecht: Reidel, pp. 141-152.

Schlick, Moritz ([1915] 1979a). “The Philosophical Significance of the Principle of Relativity”, in: Philosophical Papers Vol. 1 (1909-1922); edited by H. L. Mulder and B. van de Velde-Schlick. Dordrecht: Reidel, pp. 153-189.

Schlick, Moritz ([1917] 1979a). “Space and Time in Contemporary Physics”, in: Philosophical Papers Vol. 1 (1909-1922); edited by H. L. Mulder and B. van de Velde-Schlick. Dordrecht: Reidel, pp. 207-269.

Schlick, Moritz ([1918] 1974). General Theory of Knowledge; translated by A. E. Blumberg. Wien, New York: Springer.

Schlick, Moritz ([1919] 1979a). “Appearance and Essence”, in: Philosophical Papers Vol. 1 (1909-1922); edited by H. L. Mulder and B. van de Velde-Schlick. Dordrecht: Reidel, pp. 270-287.

Schlick, Moritz (1929). Review of Rudolf Carnap, Der logische Aufbau der Welt, in: Die Naturwissenschaften 17, pp. 550-551.

Schlick, Moritz ([1930] 1979b). “The Turning Point in Philosophy”, in: Philosophical Papers Vol. 2 (1925-1936); edited by H. L. Mulder and B. van de Velde-Schlick. Dordrecht: Reidel, pp. 154-160.

Schlick, Moritz ([1932] 1979b). “Positivism and Realism”, in: Philosophical Papers Vol. 2 (1925-1936); edited by H. L. Mulder and B. van de Velde-Schlick. Dordrecht: Reidel, pp. 259-284.

Seck, Carsten (2008). Theorien und Tatsachen: Eine Untersuchung zur wissenschaftstheoriegeschichtlichen Charakteristik der theoretischen Philosophie des frühen Moritz Schlick. Paderborn: Mentis.

Uebel, Thomas (2004). “Carnap, the Left Vienna Circle and Neopositivist Antimetaphysics”, in: S. Awodey and C. Klein (eds.), Carnap Brought Home: The View from Jena. Chicago, LaSalle: Open Court, pp. 247-278

Uebel, Thomas (2007). Empiricism at the Crossroads: The Vienna Circle’s Protocol-Sentence Debate. Chicago, LaSalle: Open Court

1. Moritz Schlick to Rudolf Carnap, March 14, 1926. The German original reads as follows: “Der Titel Ihrer Arbeit, auf den benanntlich in mancher Hinsicht viel ankommt, scheint mir nicht sehr praktisch gewählt zu sein, da auch ein chemisches oder medizinisches Werk ‘Konstitutionstheorie’ heißen könnte. Ein Name, der über den philosophischen Charakter der Schrift keinen Zweifel lässt, wäre gewiß praktischer. Wie wäre es mit ‚Der logische Aufbau der Welt?‘ Daß es sich um eine Konstitutionstheorie der Erkenntnisgegenstände handelt, könnte dann der Untertitel sagen. Vielleicht nehmen Sie zu diesem Vorschlag Stellung. Ein mehr philosophischer Titel wäre unter allen Umständen zweckmäßig.” [↑](#footnote-ref-1)
2. Rudolf Carnap to Moritz Schlick, March 19, 1926. The German original reads as follows: “Ihrem Rate folgend möchte ich den Titel des Manuskripts so fassen: ‘Der logische Aufbau der Welt. Versuch einer Konstitutionstheorie der Begriffe‘. […] Ob hiermit die endgültige Lösung des Titelproblems gefunden ist, weiß ich noch nicht. Darüber würde ich gern später mal mit Ihnen sprechen. Für Ihren Rat und Vorschlag bin ich Ihnen sehr dankbar.” [↑](#footnote-ref-2)
3. Rudolf Carnap to Moritz Schlick, December 1927. The German original reads as follows: “Der bisher beabsichtigte Titel ‘Der logische Aufbau der Welt. Versuch einer Konstitutionstheorie der Begriffe’ scheint mir in Konflikt zu geraten mit einer Arbeit, die ich für später plane. […] An einer Stelle des Buches deute ich kurz an, dass ein anderes Konst.-system möglich ist; mit physischer (‘materialistischer’) Basis. […] Welches der beiden Systeme verdient mehr den Namen eines ‘Aufbaues der Wirklichkeit’? […] Ich möchte *den Buchtitiel jetzt schon mit Rücksicht auf diesen späteren Plan wählen*. Vielleicht jetzt ‘Erkenntnislogik’; das Spätere ‘Wirklichkeitslogik’? Dazu der frühere Untertitel? Oder: ‘Der logische Aufbau der Erkenntnis’, später: ‘Der logische Aufbau der Welt’? Ist ‘Erkenntnislogik’ oder ‘Logik der Erkenntnis’ zu blass? Für Vorschläge wäre ich sehr dankbar.” [↑](#footnote-ref-3)
4. Moritz Schlick to Rudolf Carnap, January 4, 1928. The German original reads as follows: “Dass der Verlagsvertrag Deines Buches endgültig abgeschlossen ist, war mir eine sehr willkommene Nachricht. Über den Titel des Werkes möchte folgendes sagen: Ein Buchtitel hat nicht blos [*sic!*] die Aufgabe, den Inhalt des Werkes richtig zu bezeichnen, sondern auf das wichtigste des Inhaltes oder der Absicht mit suggestiver Kraft hinzudeuten – ja dies letztere ist sogar die Hauptsache. Ich würde daher von den Titeln, die Du am Schlusse Deines Zettels vorschlägst, entschieden abraten; sie sind in der Tat zu blass. Das Grundlegende an Deinem Buche […] sind doch die allgemeinen Ausführungen über die Prinzipien der Konstitution, und daran schließt sich erst der Aufbau des Erkenntnissystems. Für diese prinzipielle Grundlegung […] scheint mir nun ‘Der logische Aufbau der Welt’ doch der geeignete Titel zu sein, wobei diese Worte allerdings so zu verstehen sind, dass es sich in erster Linie um die Prinzipien eines solchen Aufbaus überhaupt, weniger um seine wirkliche und spezielle Durchführung handelt.” [↑](#footnote-ref-4)
5. As Carnap reports to Schlick in a letter dated August 6, 1928, it was the publisher Wilhelm Benary who suppressed or merely forgot to include the subtitle. Carnap himself, when reading the proofs, did, as he points out in the letter to Schlick, not realize that the subtitle was lacking. [↑](#footnote-ref-5)
6. Here and in what follows I heavily draw on Neuber 2011 and 2012. [↑](#footnote-ref-6)
7. For the historical details of the project of a ‘scientific philosophy’ (and its Kantian roots) see Richardson 1997 and Friedman 2012. [↑](#footnote-ref-7)
8. For a detailed reconstruction, see Neuber 2014. [↑](#footnote-ref-8)
9. See, for example, Kant [1787] 1998, B 66: “It is […] indubitably certain and not merely possible or even probable that space and time […] are merely subjective conditions of all our intuition, in relation to which therefore all objects are mere appearances and not things given for themselves in this way; about these appearances, further, much may be said *a priori* that concerns their form but nothing whatsoever about the things in themselves that may ground them.” [↑](#footnote-ref-9)
10. The corresponding diagnosis of a ‘crisis of intuition’ is extensively discussed in Neuber 2012, ch. 1. [↑](#footnote-ref-10)
11. Interestingly enough, Schlick, by establishing the conception of scientific knowledge as purely conceptual knowledge in his *Allgemeine Erkenntnislehre*, refers the reader to Külpe’s theory of scientific concepts as “fixed coordinations between signs and signified objects” (see Schlick [1918] 1974, § 5, footnote 2 and Külpe 1912, p. 226). [↑](#footnote-ref-11)
12. For the critical realists’ ‘substantialism,’ see Neuber 2012, p. 69. [↑](#footnote-ref-12)
13. See Carnap [1928] 1968, p. 29: “[S]cience wants to speak about what is objective, and whatever does not belong to the structure but to the material (i.e., anything that can be pointed out in a concrete ostensive definition) is, in the final analysis, subjective. One can easily see that physics is almost altogether desubjectivized, since almost all physical concepts have been transformed into purely structural concepts.” [↑](#footnote-ref-13)
14. The essential passage in this connection reads as follows: “In order to fix a point in space, we must in some way or other, directly or indirectly, point to it: we must make the point of a pair of compasses, or a finger, or the intersection of cross-wires, coincide with it (i.e., bring about a time-space coincidence of two elements which are usually apart). Now these coincidences always occur consistently for all the intuitional spaces of the various senses and for various individuals. It is just on account of this that a ‘point’ is defined which is objective, i.e. independent of individual experiences and valid for all. […] Upon close investigation, we find that we arrive at the construction of physical space and time by just this method of coincidences and by no other process. The space-time manifold is neither more nor less than the quintessence of objective elements as defined by this method. The fact of its being a four-dimensional manifold follows from experience in the application of the method itself.” (Schlick [1917] 1979a, p. 262-63) [↑](#footnote-ref-14)
15. In the remarks on the references to § 136, Carnap states: “That the world of physics is completely free from sense data is shown by Schlick [Raum und Zeit] 93f. and Carnap [Phys. Begr.]; the latter also gives reasons for the transition from the qualitative perceptual world to the quantitative physical world (p. 51ff.).” Carnap, in the mentioned little book on Physikalische Begriffsbildung (1926), refers (in the bibliography) to both Schlick’s Space and Time in Contemporary Physics and to the latter’s “Naturphilosophie” from 1925. The passage to which he refers in § 136 of the Aufbau reads as follows: “The objects of physics are […] not the data of sense: the space of physics is not in any way given with our perceptions, but is a product of our conceptions. […] Physics does not use colour as a property of the object with which it is associated, but only frequencies of the vibrations of electrons. Nor does it work with qualities of heat, but only with kinetic energy of the molecules etc.” (Schlick [1917] 1979a, pp. 260-61) [↑](#footnote-ref-15)
16. I have to thank Clinton Tolley for helpful comments in this regard. [↑](#footnote-ref-16)