**Critical Realism in Perspective –**

**Remarks on a Neglected Current in Neo-Kantian Epistemology**

***Abstract.*** Critical realism is a frequently mentioned, but not very well-known, late nineteenth-/early twentieth-century philosophical tradition. Having its roots in Kantian epistemology, critical realism is best characterized as a revisionist approach toward the original Kantian doctrine. Its most outstanding thesis is the idea that Kantian things-in-themselves are knowable. This idea was—at least implicitly—suggested by thinkers such as Alois Riehl, Wilhelm Wundt, and Oswald Külpe. Interestingly enough, the philosophical position of the early Moritz Schlick stands in the critical realist tradition as well. As will be outlined in the course of this paper, both Schlick’s magnum opus *General Theory of Knowledge* (1918) and his seminal *Space and Time in Contemporary Physics* (1917) are based on the assumption that the objects of science are relations and that relations have the status of Kantian things-in-themselves. By way of conclusion, I shall point out that this— more or less directly—leads to the current debate over ‘structural’ realism.

In a retrospective article on “The *Wiener Kreis* in America,” Herbert Feigl commented on the historical development of logical empiricism as follows:

“Perhaps the most important and constructive aspect in the transition to Logical Empiricism was the element of empirical or scientific realism that became increasingly prominent in our views. Reichenbach and I had already opposed the phenomenalistic reduction during the twenties. […] We regretted that Schlick had abandoned his early critical realism, and we tried to reinstate it in a more defensible form. This was achieved through the liberalization of the empiricist criterion of meaning. Verifiability was replaced by (at least indirect and incomplete) testability […]. On the basis of this it makes perfectly good sense to speak of the existence of theoretical entities.” (Feigl [1969] 1981, p. 80)

At another place Feigl points out that

“Schlick’s early realism, expounded in his *Allgemeine Erkenntnislehre* of 1918 and 1925, was an admirable informal anticipation of the sort of realism toward which Carnap (ever since ‘Testability and Meaning’ and his recent work on inductive logic) has been modifying his earlier positivism.” (Feigl [1950] 1981, p. 231)

Given the historical adequacy of Feigl’s reports, one is tempted to assume that the history of logical empiricism was much more complex (and ‘dialectical’) than commonly supposed. Thus, it appears mandatory to distinguish between the stage of reductive—phenomenalistic—logical positivism, on the one hand, and the stage of sophisticated—realistically inspired—logical empiricism, on the other. The latter is rooted in early Moritz Schlick’s affiliation to the critical realist movement and the later Carnap, Reichenbach and Feigl are supposed to be its most determined defenders.[[1]](#footnote-1)

 Thus, where lies the crux of the critical realist movement? Moreover, what was its impact on the early Schlick’s and the later logical empiricists’ positions? In considering these questions, I shall proceed as follows. In section 1, I will give a rough outline of the critical realists’ program. In section 2, I shall present some influential figures of this program. Section 3 addresses in some detail the critical realists’ claim that Kantian things-in-themselves are knowable. Section 4 attempts to clarify how Schlick, in his early writings, appropriated essential aspects of the critical realist program and how this appropriation can be brought in connection with current ‘structural’ realism. Finally, in the short last section, I shall briefly comment on the later—Viennese—Schlick’s approach toward the realism issue.

**1. What is critical realism?**

As a first approximation, critical realism can be characterized as an autonomous current in *transcendental revisionism*.[[2]](#footnote-2) By ‘transcendental revisionism’ I understand the attempt to reconcile the original Kantian 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). A closer look reveals that there were two dominant versions of transcendental revisionism in late nineteenth-/early twentieth-century philosophy in German-speaking countries. There was, firstly, the current of critical (or ‘logical’) idealism of the so-called Marburg school of Neo-Kantianism. Defended by thinkers such as Hermann Cohen, Paul Natorp and Ernst Cassirer, the critical idealists’ approach amounted primarily to a revision of the Kantian conception of the *A Priori*. Thus, for example, Cassirer argued, both in his seminal *Substance and Function* (cf. Cassirer 1910) and in his book on Einstein’s theory of relativity (cf. Cassirer 1921), for a replacement of the constitutive understanding of a priori principles by a purely regulative understanding. Accordingly, the original Kantian conception of static and absolutely valid a priori principles (like, for example, the principles of Euclidean geometry and Newtonian mechanics) became transformed into a more dynamical and relative conception of such principles. This transformation, in turn, allowed—at least on the critical idealist reading—to account for the revolutionary changes in mathematics and physics around 1900.[[3]](#footnote-3)

 No doubt, the critical idealist movement was an important (and quite influential) attempt at revising Kant’s theory of scientific knowledge. However, there was a second—less well-known—current of transcendental revisionism, namely the critical *realist* movement. As will be suggested in the following sections, this movement deserves more attention than it has received so far. Yet, for the moment it will suffice to make note of two issues: 1) The critical realists agreed with the critical idealists that the aim of philosophy consists in the critical reflection on the preconditions of scientific knowledge. This is the reason why both currents share the attribute ‘critical’ and why both currents are to be attached to the more general project of a ‘scientific philosophy’ (*wissenschaftliche Philosophie*).[[4]](#footnote-4) 2) The critical realists disagreed with the critical idealists on the determination of the very *object* of science. While the critical idealists confined the realm of scientific (especially physical) objects to the progress of conceptual development—thereby implying that the object of scientific knowledge is not ‘given’ (*gegeben*) but only ‘set as a task’ (*aufgegeben*)—the critical realists insisted that the objects of science are *given* *as they are in themselves*. This sounds somewhat naïve, but we will see later that the issue was more complex and less direct. For the time being, however, it should be kept in mind that the assumption of knowable things-in-themselves was the peculiar feature of the critical realists’ attempt at revising the Kantian conception of scientific knowledge.

**2. Some protagonists in the debate**

Taking a less well-known philosophical current in perspective means (among other things) to tell something about its outstanding proponents. In the case of critical realism this task is rather challenging because the movement as a whole was quite heterogeneous. The following overview should therefore be regarded as a first and (very) preliminary sketch in need of further elaboration.

 To begin with, the one who might be seen as the ‘founder’ of the critical realist movement was Alois Riehl (1844-1924). In his three-volume *Der philosophische Kriticismus und seine Bedeutung für die positive Wissenschaft* (1876, 1879, 1887), Riehl attempted to combine Kantian criticism with certain elements of British (especially Lockean) empiricism. As becomes obvious from the title, Riehl developed his ideas in direct confrontation with the ‘positive’ (experiential) sciences. In this respect he was a typical representative of the idea of a scientific philosophy (see, in this connection, also Riehl 1883). Furthermore, it was Riehl who, in volume 1 of *Der philosophische Kriticismus*, defended the opinion that Kant’s *Critique of Pure Reason* is intimately correlated with a “theory of reality” (*Wirklichkeitslehre*) (cf. Riehl [1876] 1908, p. 562). Thus, in a section headed “Erscheinung, Ding an sich, Noumenon”, Riehl argued for the reality of things-in-themselves, thereby refusing to interpret them as mere ‘limiting concepts’ in the sense of Marburgian Neo-Kantianism (cf. *id*., p. 561).[[5]](#footnote-5) For Riehl, things-in-themselves had to be taken ontologically seriously. More precisely, he saw in them the objective basis of spatio-temporal appearances.[[6]](#footnote-6) Correspondingly, Riehl, in volume 3 of *Der philosophische Kriticismus*, argued that we acquire knowledge of things-in-themselves *via* our knowledge of appearances (cf. Riehl [1887] 1926, pp. 164-65). We will come back to this point in the following section. In the present context, though, it is important to realize that Riehl characterizes the view that we acquire knowledge of things-in-themselves via knowledge of appearances explicitly as “critical realism” (cf. Riehl [1887] 1926, p. 163); furthermore, he distinguishes this “Copernican” attitude (—as he puts it) from the “Ptolemaic”—or “phenomenalistic”—attitude (cf. *ibidem*). Whereas according to the latter realism *precedes* criticism, the Copernican—critical realist—approach implies that realism *follows* criticism.[[7]](#footnote-7)

 A similar, though clearer and more explicit distinction can be found in the work of another proponent of the critical realist movement, Wilhelm Wundt (1832-1920). Wundt, one of the founding fathers of experimental psychology, published in 1896 an extended article titled “Über naiven und kritischen Realismus.” In this paper, Wundt was primarily engaged with refuting the (as it was termed) philosophy of immanence (Schuppe, Schubert-Soldern, Rehmke), on the one hand, and ‘empiriocriticism’ (Avenarius, Mach, Petzoldt), on the other. Since both schools of thought sought to base knowledge on the ‘immediately given,’ Wundt lumped them together under the label “naïve realism” (Wundt [1896] 1910, p. 265). From this, in his opinion wrong-headed, point of view he demarcated “critical realism” (*ibidem*), the characteristic feature of which he saw in the *emancipation* from the immediately given. In consequence, critical realism, in the view of Wundt, was committed not only to the reality of what was directly perceivable but also to the reality of atoms, electromagnetic fields and other inferred (theoretically postulated) entities. The essential tool of critically scrutinizing the positing of such entities was, according to Wundt, the systematic investigation of the *history* of science (cf. *id.*, pp. 267-68). Given the liability of the historical method, the “Copernican attitude” in Wundt amounted to the ‘correction’ of our immediate sensory experiences by the positing and critical scrutiny of theoretical, not directly perceivable constructs. That is, for Wundt, realism *follows* criticism insofar as it is dependent on a preceding analysis of the factual (objective) basis of our direct perceptual experience.[[8]](#footnote-8)

 The perhaps most articulated version of the critical realist program can be found in the work of Wundt’s former student (and founder of the ‘Würzburg school of psychology’) Oswald Külpe (1862-1915). Particularly interesting in this connection in his three-volume magnum opus *Die Realisierung: Ein Beitrag zur Grundlegung der Realwissenschaften* (1912, 1920, 1923). As the subtitle indicates, Külpe’s aim is to deliver a ‘foundation’ of the ‘real’ (experiential) sciences. Thus, like Riehl and Wundt, Külpe collaborates in the project of realizing the idea of a scientific philosophy. Furthermore, his understanding of the term ‘critical’ comes rather close to the one propounded especially by Wundt. In a more or less Lockean vein,[[9]](#footnote-9) Külpe draws a principled distinction between subjective “sense qualities,” on the one hand, and objective, non-perceptual “realities,” on the other (cf. Külpe 1912, pp. 1-3). While, according to Külpe, “naïve” realism is confined to the analysis of the former, “critical” realism sets itself the task to critically scrutinize the theoretically postulated entities (“realities”) of science (cf. *id*, p. 26). It is for this reason that critical realism, for Külpe, is identical with *scientific* realism (*wissenschaftlicher Realismus*) (cf. *id.,* p. 45), which, in turn—as Külpe writes at another place—has the status of a “probable hypothesis” (Külpe 1910, p. 161).[[10]](#footnote-10) Moreover, Külpe’s attitude toward the original Kantian doctrine becomes sufficiently clear by his discussion of the following two questions: 1) “How is a positing [*Setzung*] of the real possible?” (Külpe 1912, p. 4) 2) “How is a determination [*Bestimmung*] of the real possible?” (*id*., p. 5) In Külpe’s view, Kant only answered the first question. That is, he postulated the existence of things-in-themselves, but he did not say anything about their nature. We will see in the following section that Külpe himself is eager to tackle also the challenge of the second question by offering an elaborated theory of scientific *explanation*.[[11]](#footnote-11)

 To sum up so far, critical realism is best characterized as a late nineteenth/early twentieth- century variant of transcendental revisionism. It embraces two key aspects: 1) At the methodological level, critical realism forms part of the larger project of realizing the idea of a scientific philosophy. It is apt to speak of the *anti-metaphysical* (or *anti-speculative*) aspect in this connection.[[12]](#footnote-12) 2) At the epistemological level, critical realism can be identified by the idea that Kantian things-in-themselves are knowable. Yet, it is this very idea that needs further clarification.[[13]](#footnote-13)

**3. The knowability thesis**

The most straightforward definition of the *realist* *component* of critical realism was given by one of its leading advocates, the Munich philosopher and psychologist Erich Becher.[[14]](#footnote-14) For Becher, “*[r]ealism is the doctrine that things-in-themselves are knowable*” (Becher 1914, p. 69). Now, from a ‘genuinely Kantian’ perspective, this point of view is more than problematic. Without devolving into exegetical details, it can be stated that, for Kant, the assumption of (theoretically) knowable things-in-themselves was anathema. Thus, as early as in the ‘Transcendental Aesthetic’ of his *Critique of Pure Reason*, Kant categorically declares:

“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.” (Kant [1787] 1998, B 66)

Kant called this doctrine “transcendental *idealism*.” As he puts it in the ‘Transcendental Dialectic’ of his *Critique of Pure Reason*, transcendental idealism implies that

“everything intuited in space or in time, hence all objects of an experience possible for us, are nothing but appearances, i.e., mere representations, which, as they are represented, as extended beings or series of alterations, have outside our thoughts no existence grounded in themselves.” (*id.*, B 518-19)

To be sure, Kant, at the same time, refuted (Berkeleyan) “dogmatic” and (Cartesian) “skeptical” (or “problematic”) idealism (cf. *id.*, B 274-279 and B 377-80) and argued in favor of what he called—at least in the first edition of the *Critique of Pure Reason*— “empirical realism” (cf. Kant [1781] 1998, A 370). However, this sort of realism was explicitly restricted to knowledge of appearances and had therefore nothing to do with things-in-themselves. On Kant’s account, no other form of realism was worth taking seriously. In particular what he called “*transcendental* realism,” in his view, was doomed to fail. According to Kant, transcendental realism “makes mere representations into things in themselves” (Kants [1787] 1998, B 519). The fatal consequence of this maneuver is that realism becomes indistinguishable from *empirical idealism*. Kant writes:

“[T]ranscendental realism necessarily falls into embarrassment, and finds itself required to give way to empirical idealism, because it regards the objects of outer sense as something different from the senses themselves and regards mere appearances as self-sufficient beings that are found external to us; for here, even with our best consciousness of our representation of these things, it is obviously far from certain that if the representation exists, then the object corresponding to it would also exist; but in our system [i.e. transcendental idealism; M.N.], on the contrary, these external things—namely, matter in all its forms and alterations—are nothing but mere representations, i.e., representations in us, of whose reality we are immediately conscious.” (Kant [1781] 1998, A 371-72)

The plausibility of Kant’s conception notwithstanding, it is clear that the critical realist movement, according to Kant himself, would fall under the rubric of transcendental realism and should therefore be rejected. More precisely, Kant would argue that the critical/transcendental realist must problematically *infer* his putative object of experience, whereas a more empirical understanding tells us that—space and time being ‘pure forms of intuition’—objects of experience can be *directly* *perceived*. Thus, in contrast to the critical/transcendental realist, “the transcendental idealist is an empirical realist, and grants to matter, as appearance, a reality which need not be inferred, but is immediately perceived (*id.*, p. 371).”[[15]](#footnote-15) Or in other words: Transcendental idealism accounts for the needs of a non-metaphysical (non-inferential) and at the same time realist conception of empirical knowledge.[[16]](#footnote-16)

 However, there is no revision without (at least a certain degree of) demolition. That is, as soon as the attempt is made to modify certain aspects of the original Kantian doctrine, a more or less new and independent conception—partly or even entirely alien to the original—is the (intended) outcome. This holds true for Marburgian Neo-Kantianism, and it holds no less true for critical realism. Accordingly, transcendental revisionism in general should absolutely not be conflated with Kant exegesis.

 As for the critical realist movement in particular, the assumption of knowable things-in-themselves was fairly diametrically opposed to Kant’s original doctrine. As already indicated, the crux of the critical realist revision was the view that things-in-themselves can be known *via* our knowledge of appearances.[[17]](#footnote-17) Riehl, for example, argued that (surprisingly, according to Kant) “mediate” (*mittelbare*) knowledge of things-in-themselves is possible (cf. Riehl [1876] 1908, p. 479 and Riehl [1887] 1926, p. 165). Similarly, Külpe held that appearances are ontologically “grounded” in things-in-themselves and that the latter can therefore be inferred from the former (cf. Külpe 1920, pp. 210-12). More precisely, Külpe was of the opinion that things-in-themselves *can be determined with respect to their very nature by* *abductive reasoning* (cf. *ibidem* and Neuber 2012, pp. 52-3). From the original Kantian perspective, this would be impossible, because the causality principle, according to Kant, does not apply to things-in-themselves, but only to intuited phenomena (cf. Kant [1787] 1998, B xxvii-xxviii, B 232-256). However, within the critical realist conception, knowledge of things-in-themselves is possible since the Kantian faculty of intuition plays only the role of an ‘epistemic starting point’ that we eventually abandon for the sake of purely conceptual knowledge. Thus, for example, Riehl writes in this connection:

“We see, in fact, how science reduces the content of experience to its lawlike elements, to what recurs in similar form, to what is accessible to quantitative determination and is thus expressible in numerical operations, in short, to the *conceivable*. Everything else is an object, not of *conceiving*, but of immediate *acquaintance*, and hence of feeling, sensation and perception.” (Riehl [1879] 1925, p. 221)

Riehl’s distinction between perceptual—i.e. everyday—“acquaintance” (*Wissen*) and quantitatively determined—i.e. scientific—“conceiving” (*Begreifen*) can hardly be overestimated in its historical significance; not only that, a very similar distinction can be found in the early work of Bertrand Russell.[[18]](#footnote-18) More to the point, it was the early Schlick who, in his *General Theory of Knowledge*, explicitly took over Riehl’s (and Russell’s) distinction (cf. Schlick [1925] 1974, p. 83) (we will return to this issue later). In the present context, it is important to realize that the critical realists thought that, by downgrading the role of intuition, the route to knowledge of things-in-themselves becomes free. It is for this reason that, for instance, Külpe straightforwardly *defined* knowledge as “conceptual coordination” (*begriffliche Zuordnung*) and declared: “For objective science, concepts are ‘*fixed coordinations*’ between signs and signified objects.” (Külpe 1912, p. 226) By “signified objects,” Külpe meant, not surprisingly, things-in-themselves.

It is interesting to note that the critical *idealists* also downgraded the role of the Kantian faculty of intuition. But they draw different consequences form this downgrading. According to the critical idealists, it was not the realm of things-in-themselves that became accessible by viewing intuition only as an epistemic starting point (as I would term it). Rather, it was *the* *conceptual system of science itself* that essentially became the focus of analysis (see, for example, Cohen 1902; Natorp 1910, esp. p. 95; Cassirer 1910; see further Neuber 2012, pp. 135-36). In the background of this—plainly un-Kantian—shift of perspective stood, among other things, the development of modern (‘unintuitive’) mathematics (cf. Friedman 2005). In the case of the critical realists, however, *psychology* played a decisive role. Thus, for example, Külpe argued as early on as in his *Grundriss der Psychologie* of 1893—and later other members of the Würzburg school of psychology (Ach, Bühler, Messer, etc.) would follow in his footsteps—for an experimentally supported theory of “intuition-free thinking”(*anschauungsfreies Denken*) that he, in the central work for his philosophical program (i.e. *Die Realisierung*), took as the basis for establishing a general (‘semiotic’) theory of knowledge of “realities” (which are essentially things-in-themselves).[[19]](#footnote-19) Later, it will be made clear later that Schlick was heavily inspired by Külpe’s theory.

 One further aspect of the critical realist program deserves consideration. It has probably become clear by now that in the view of the critical realists, the objects of science had the status of things-in-themselves. *But what was the status of things-in-themselves?* The critical realist answer to this question is quite traditional. It amounts to the (rather Aristotelian) view that what is ‘really real’ are *substances*. Thus, for example, Becher equated “the thing” with substance and characterized the latter as the “bearer of attributes” which has existence and identity independently of any possible attribute (cf. Becher 1915, p. 10). In a similar vein, Riehl defined the thing-in-itself as “the persistent” (*das Beharrliche*) and qualified this definition by adding that “matter and force are the substantial of outer experience” (Riehl [1887] 1926, p. 66). Moreover, Riehl devoted a whole chapter of the second volume of *Der philosophische Kriticismus* to the connection of substance, matter and force (cf. Riehl [1879] 1925, pp. 303-322), arguing, among other things, that physics and chemistry “deliver the proof of the quantitative persistence of matter” (*id*., p. 313). The most extended critical realist discussion of the substantialist account of things-in-themselves can (as far as I can see) be found in volume 3 of Külpe’s *Die Realisierung* (cf. Külpe 1923, pp. 244-309). There, Külpe points out that things-in-themselves, i.e. substances, can be determined as the independently existing, unchangeable and persistent basis of the scientific explanation of the behavior of observable phenomena. Being essentially inferred, substantial things-in-themselves, for Külpe, are entities like atoms, molecules and energies (cf. *id.,* pp. 245-46).[[20]](#footnote-20) It is on the basis of the postulation of these entities that appearances become explainable in terms of *scientific* realism.[[21]](#footnote-21) In fact, it is this sort of ‘inference to the best explanation’ that should be seen as one of the most pivotal features of Külpe’s general conception of “realization” (cf. Külpe 1923, pp. 308-09). On the whole, it can be said that Külpe, no less than Riehl (and Becher), ‘substantialized’ the Kantian things-in-themselves.[[22]](#footnote-22)

 However, the critical realists’ indebtedness to substantialist thinking might be regarded as somewhat reactionary. At any rate, it might be argued that at the time when the critical realists put forward their substantialist account of science and nature a viable alternative was already available. I think of Cassirer’s *Substance and Function* here, and I dare claim that Cassirer indeed had a serious objection against all forms of substantialism. In Cassirer’s view (as is widely known), the development of modern science moves from a (quasi-Aristotelian) substantialist understanding of concepts, such as ‘energy’ or ‘atom’, to a functional (or relational) understanding of such concepts (cf. Cassirer 1910, esp. chapter 4). Without elaborating on the details of this theory, I confine myself here to indicating that Cassirer’s point of view had tremendous impact on the subsequent history of thought within the German-speaking context.[[23]](#footnote-23)

**4. Schlick’s appropriation of the critical realist program**

Having inspected in some detail the critical realist program, we are now in a position to discuss what the early Schlick made out of it. In order to give some context to what follows, let us once again quote from Feigl:

“[M]y original position, long before I decided to study at the University of Vienna, had been close to a critical realism which I had first formulated for myself in a rather unsophisticated manner when during my adolescence I was deeply impressed with the achievements of astronomy, chemistry, and theoretical physics. I began reading the positivists, but also the Neo-Kantian Alois Riehl, the German critical realists Külpe, Becher, and Freytag during my last year in secondary school; and finally on the suggestion of a distant relative, a prominent professor of medicine (at the German University in Prague), I read two books by Schlick which had been highly recommended to him by no less a person than his old friend Albert Einstein. Schlick’s *Allgemeine Erkenntnislehre* […] struck me like a thunderbolt. In the beautiful lucid and magnificently penetrating book Schlick argued essentially for a critical 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, pp. 38-39)

It must be recognized that Feigl’s claim of a “conversion” is not uncontested. Ludovico Geymonat, for example, has argued that many ideas that can be found in the work of the early Schlick reoccurred in his later—Viennese—writings as well as in the writings of Carnap and Wittgenstein, who were allegedly responsible for his ‘conversion’ (cf. Geymonat 1985). In the final section of this paper, it will be made clearer that there are good arguments in favor of Feigl’s rather than Geymonat’s assessment. Yet, for the time being, it is enough to emphasize that Schlick’s early (pre-Viennese) point of view stood in the critical realist tradition.

That said, one should recognize that Schlick never *explicitly* characterized himself as a critical realist.[[24]](#footnote-24) Accordingly, it appears plausible to characterize his early philosophical position as merely being inspired by the critical realist tradition rather than being critical realist *tout court*. On the interpretation I wish to offer, the early Schlick’s position was somewhat of a hybrid of the critical realists’ insistence on knowable things-in-themselves and the early Cassirer’s *relationalism*.

Before going into the details of this interpretative proposal, a few words must be said concerning Schlick’s appreciation of Kantian theoretical philosophy. In the first instance, Kant, according to Schlick, was one of the most important pioneers of the idea of a scientific philosophy. Thus, in his paper on “The Philosophical Significance of the Principle of Relativity,” Schlick points out:

“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 we do find foundations so firm and sharply defined, that a change in them produces a notable upheaval, which can then also acquire an influence on our world-view.” (Schlick [1915] 1979a, p. 153)

It is not difficult to see that Schlick is accounting here for the *critical component* of critical realism (as well as of critical idealism!). More precisely, Schlick ties Kantian critical method to the *factual development of science*. Consequently, as Michael Friedman correctly notes, “Schlick aimed to do for Einstein’s physics what Kant had done for Newton’s, namely, to explain and exhibit the special features of this physics that make it a model or paradigm of coherent rational knowledge of nature” (Friedman 2001, p. 14). Schlick, it might be added, can therefore be regarded as a follower of Kantian methodology in its relation—and updated application—to science and scientific theory construction.

 As for the *realist component*, Schlick seems to aim to continue the Kantian heritage as well. In an article on “Appearance and Essence”—published, typically enough, in the *Kant-Studien*—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)

The aim to realistically revise the original Kantian doctrine by arguing for the knowability of things-in-themselves could hardly be formulated clearer! Yet, as we have seen before, this realistic strategy deviates rather drastically from what Kant himself in fact intended. Exegetical issues like this notwithstanding,[[25]](#footnote-25) it should be further noted that Schlick affirmatively relied on the critical realists’ downgrading of the Kantian faculty of intuition. Or, in his own words:

“Kant has uncritically presupposed that in order to know an object, an *intuition* of the object is ultimately in some way necessary. In the very first sentence of the transcendental aesthetics he says this with complete clarity.[[[26]](#footnote-26)] 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.” (*Ibidem*)

In consequence of this downgrading of intuition, Schlick arrives at a conception of purely conceptual knowledge that bears obvious similarities with the one propounded by Külpe. Thus, in a chapter titled “Knowing by Means of Concepts”, Schlick, in his *Allgemeine Erkenntnislehre*, argues that

“[e]pistemologically, the import of the conceptual function consists precisely in *signifying* or *designatin*g. Here, however, to signify means nothing more than to *coordinate* or *associate* (*Zuordnen*), that is, to place in a one-one or at most a many-one correspondence (“*Zuordnung*”). To say that objects fall under a certain concept is to say only that we have coordinated or associated them with this concept.” (Schlick [1925] 1974, p. 23)

In the footnote attached to this passage, Schlick refers the reader to Külpe’s aforementioned theory of concepts as “fixed coordinations,” as it can be found in volume 1 of *Die Realisierung* (cf. Külpe 1912, p. 226).[[27]](#footnote-27) Moreover, Schlick approved of Külpe’s distinction between “positing” and “determination” of the real, thereby committing himself to an epistemologically affirmative understanding of things-in-themselves (cf. Schlick [1925] 1974, p. 175).

 However, Schlick did not unreservedly align himself with Külpe. Rather, he was fairly critical of Külpe’s ‘dualistic world-view.’ More concretely, Schlick conceded that there are things that can be immediately perceived and things that are ‘transcendent’ (cf. *id.*, p. 238). But he did not go as far as to endorse the view that there are, as it were, *two worlds*, i.e., the world of appearances and the world of things-in-themselves.[[28]](#footnote-28) Rather, Schlick held the whole distinction to be flawed. Accordingly, he wrote:

“There is only *one* reality. And whatever lies within its domain is in principle equally accessible, in its being as well as in its essence, to our cognition. Only a small part of this reality is ever given to us. The remainder is not given. But the separation thus effectuated between the subjective and the objective is accidental in character. It is not fundamental, as the separation between essence and appearance is supposed to be—a separation that we have recognized as not feasible.” (*id.*, p. 244)

In short, Schlick committed himself to a certain variant of *monism*.[[29]](#footnote-29)

 For reasons of space, Schlick’s critique of Külpe cannot be discussed in detail here. But one additional remark concerning the ‘ontology of science’ is worth making. According to Schlick, the critical realists’, and, especially, Külpe’s substantialist interpretation of things-in-themselves is an anachronism. We simply do not have enough evidence to say that Schlick was directly ‘influenced’ by Cassirer in this respect; but his plea for an essentially *relationalist* understanding of science comes rather close to Cassirer’s ‘anti-substantialism.’[[30]](#footnote-30) Referring himself to the older—empiricist (i.e. Humean and Machean)—critiques of the substantialist point of view, Schlick states that

“an atom or an electron is to be conceived of as a union of qualities that are bound together by definite laws, and not as a substantial *thing*, which bears its qualities as properties and can thus be distinguished from them as their bearer. […] We need not concern ourselves any further with this idea. […] In the last analysis, all knowledge is a matter of relations and dependencies, not of things or substances.” (*id.*, p. 285)

As Rae Langton (commenting on Guyer 1987, pp. 351-52) has observed, such a relationalist point of view is suitable to provide “a quick route to idealism” (Langton 1998, p. 95). Still, on Schlick’s account, *relations have the status of things-in-themselves* and must therefore be interpreted in a realistic way. Schlick writes:

“[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 the relations, which exist outside of this correlation.” (Schlick [1925] 1974, p. 360)

This is a clear statement in favor of a realist ontology of relations. At the same time it is, because of its being rooted in ontology, a repudiation of a purely epistemological interpretation in the guise of Cassirer (and the Marburg school in general). Thus, it can be said that Schlick combined Cassirerian relationalism with the critical realists’ insistence on the independent reality—and knowability!—of things-in-themselves.

 Let us conclude by briefly considering a well-known case in point. In his *Space and Time in Contemporary Physics*, Schlick applied his realist-relationalist account of science and nature to Einstein’s theory of relativity (cf. Schlick [1917] 1979a; see further Friedman 1999, Howard 1999 and Neuber 2012, pp. 102-130).[[31]](#footnote-31) Demarcating his own conception from other, especially positivist interpretations of Einstein’s theory, Schlick (by applying his “method of coincidences”) argued for a thoroughly realistic understanding of spatiotemporal relations. More generally, Schlick proposed to conceive of the objects of science as mind-independent, explanatory realities:

“There is no argument whatsoever to force us to state that only the intuitional elements, colours, tones, etc., exist in the world. We might just as well assume that elements or qualities which cannot be directly experienced also exist. For example, electric forces can just as well signify elements of reality as colours and tones. They are *measurable*, and there is no reason why epistemology should reject the criterion of reality which is used in physics […]. The conception of an electron or an atom would then not necessarily be a mere working hypothesis, a condensed fiction, but could equally well designate a real connection or complex of such objective elements […]. The picture of the world, as presented by physics, would then be a system of symbols arranged into a four-dimensional scheme, by means of which we get our knowledge of reality; that is, *more* than a mere auxiliary conception, allowing us to find our way through given intuitional elements.” (Schlick [1917] 1979a, p. 265)

From here it is only a short step to the more recent attempts to establish a *structural realist* account of science and nature (cf. Worrall 1989, Ladyman 1998, French & Ladyman 2003, Esfeld & Lam 2006) Given Schlick’s relationalist dissolution of (the traditional view of) substantial things, and given further his account of scientific objects as nonetheless real, the conclusion to be drawn is that the early Schlick’s reception of the critical realist tradition paved the way for our current discussion concerning structural realism.[[32]](#footnote-32) His interpretation of spatiotemporal relations in the context of Einstein’s general theory of relativity might be seen as his paradigmatic contribution to the advancement of the structural realist point of view.

**Coda**

This is not the place for an extended discussion of Schlick’s alleged Viennese conversion from realism to positivism. However, the major reasons for accepting Feigl’s afore-quoted diagnosis of such a conversion should at least be indicated:

* For the early Schlick, relational things-in-themselves exist mind-independently, whereas for the Viennese Schlick things-in-themselves are equivalent with (Russellian) ‘logical constructions’ (cf. Schlick [1926] 1979b, p. 104).
* For the early Schlick, atoms (and other theoretical entities) are ‘transcendent,’ whereas for the Viennese Schlick they form part of Kantian ‘empirical reality,’ i.e. of the realm of appearances (cf. Schlick [1932] 1979b, p. 278).
* For the early Schlick, the statement of a transcendent reality is meaningful and scientifically relevant, whereas for the Viennese Schlick it is, as for Carnap (cf. Carnap 1928), nothing but a “certain state of feeling” (Schlick [1932] 1979b, p. 281).
* For the early Schlick, realism and positivism exclude each other, whereas for the Viennese Schlick both position are “not opposed” (*id.*, p. 283).

These are, in my view, differences that must be taken seriously: they must and will be elucidated in a later work (see Neuber [forthcoming]).[[33]](#footnote-33)

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1. There is some evidence that the distinction between (reductive-phenomenalistic) ‘logical positivism’ and (realistically inspired) ‘logical empiricism’ came up some time in the mid-1930s. At any rate, Feigl gives the following account: “Having stereotyped myself (in the notorious fanfare article written in collaboration with A. E. Blumberg and published in the Journal of Philosophy in the spring of 1931 [cf. Feigl and Blumberg 1931]) as a ‘logical positivist,’ the label has stuck to me ever since. As early as 1935, however, I abandoned the label […] and availed myself of the alias ‘logical empiricist.’ This was triggered by a remark of a French philosopher at the International Congress for the Unity of Science in Paris (1935). He burst at me: ‘Les positivists, ce sont des idiots!’.” (Feigl 1981, p. 38) [↑](#footnote-ref-1)
2. The following draws heavily on Neuber 2011 and Neuber 2012. [↑](#footnote-ref-2)
3. For a detailed reconstruction of Cassirer’s (and the Marburg school’s) revisionism see, especially, Friedman 2000, chapter 7. See further Neuber 2012, chapter 3. [↑](#footnote-ref-3)
4. For the details of this project see Richardson 1997; Friedman 2001, chapter 1; Richardson 2008; Friedman 2012. [↑](#footnote-ref-4)
5. For their interpretation as mere ‘limiting concepts,’ see especially Natorp 1910, chapter 1, §§ 4-6 and Cassirer 1910, chapter 7. [↑](#footnote-ref-5)
6. See Riehl [1876] 1908, p. 476: “It follows from Kant’s theory, even if Kant did not expressly say so, that there must be a reason for every particular empirical determination of space and time in the object that appears.” [↑](#footnote-ref-6)
7. More precisely, naïve realism, according to Riehl, takes perceptual reality for granted without reflecting on its origins. It is, as might be said, the view of the “man in the street.” [↑](#footnote-ref-7)
8. It is noteworthy, in this connection, that Wundt’s Belgian student Georges Dwelshauvers wrote some manner of a French short version of Wundt’s original article. Dwelshauvers’s contribution was titled “Réalisme naïf et réalisme critique” and also appeared in 1896. [↑](#footnote-ref-8)
9. I have to thank Adam Caulton for helpful comments in this connection. [↑](#footnote-ref-9)
10. It is interesting to note that the characterization of scientific realism as a ‘probable hypothesis’ comes remarkably close to more current (‘naturalistic’) scientific realist positions. See, in this connection, for example, Boyd 1983, Psillos 1999, Sankey 2008. [↑](#footnote-ref-10)
11. For further details of Külpe’s general conception of ‘realization’, see Henckmann 1997. [↑](#footnote-ref-11)
12. This anti-metaphysical impetus has no doubt to do with the mid-nineteenth century breakdown of speculative *Naturphilosophie*,especially in sense of Hegel and Schelling, and the parallel strengthening of the institutionalized (natural) sciences. For further details in this respect, see Schnädelbach 1983, chapter 3 and Neuber 2012, pp. 46-48. [↑](#footnote-ref-12)
13. Again it should be stressed that the critical realist movement was, as indicated above, a rather complex tradition. It is quite striking that among its defenders were many psychologists, such as (besides the already mentioned Wundt and Külpe) Gustav Störring (1860-1946), August Messer (1867-1947), and Erich Becher (1882-1929). Other critical realists in the German-speaking area were, to mention just a few, Willy Freytag (1873-?), Max Frischeisen-Köhler (1878-1923), Bernhard Bavink (1879-1947), Victor Kraft (1880-1975), and Aloys Wenzl (1887-1967). Very quite at the same time there was some sort of realist wave in the United States, embracing the so-called “new” realists, on the one hand, and the “critical” realists, on the other (for the details of this distinction, see Drake *et al.* 1920, p. viand Sellars 1969, chapter 4). Among the latter were thinkers such as George Santayana (1863-1952), Arthur Lovejoy (1873-1952), and Roy Wood Sellars (1880-1973). The relation between the German and the American brand of critical realism has, it should be emphasized, still to be researched. [↑](#footnote-ref-13)
14. Interestingly enough, it was originally Becher who was supposed to receive the prestigious Chair of the History and Philosophy of the Inductive Sciences at the University of Vienna. Since Becher, in September of 1921, declined the appointment; it was Moritz Schlick who, in August of 1922, eventually was awarded the chair. Furthermore, Becher and Schlick, since 1915, stood in correspondence, and it is obvious that (with the exception of the issue of vitalism) there was much agreement between their respective philosophical points of view. For further details in this connection, see Engler & Neuber 2006, pp. 124-25 and Friedl & Rutte 2008, pp. 11-14. [↑](#footnote-ref-14)
15. See, in this connection, also Kant’s reflections on the “transcendental ideality” and “empirical reality” of space and time in Kant [1787] 1998, B 44 and B 52-53. [↑](#footnote-ref-15)
16. It should be noted that Kant’s argument for transcendental idealism is highly controversial. Having its roots in the late eighteenth- and nineteenth-century (Jacobi, Maimon, Trendelenburg, Fischer, etc.), the debate over transcendental idealism has found its continuation in the more recent contributions by Peter Strawson (1966), Henry Allison (1983), Paul Guyer (1987) and Rae Langton (1998). Whereas, for example, Allison explicitly aims at a “defense” of transcendental idealism, Guyer (following Strawson) critically argues that “Kant’s argument for transcendental idealism from his theory of the forms of intuition does not express epistemological modesty but is rather the consequence of an exceedingly immodest interpretation of the necessity of synthetic *a priori* propositions” (1987, p. 369). As we will see later, Schlick had a rather similar objection against the transcendental idealist project. [↑](#footnote-ref-16)
17. As Rae Langton (1998, pp. 89-93) has convincingly pointed out, the view that knowledge of things-in-themselves can be acquired via knowledge of appearances (phenomena) has one of its roots in Kant’s interpretation (and critique!) of Leibniz’s version of idealism. See, in relation to this, esp. Kant [1787] 1998, B 60, B 323, B 326. [↑](#footnote-ref-17)
18. See, in this connection, Russell’s distinction between “knowledge by acquaintance” and “knowledge by description” in Russell 1910-11. [↑](#footnote-ref-18)
19. Lindenfeld 1978 gives a fairly instructive account of the relation between psychology and philosophy in Külpe’s work. [↑](#footnote-ref-19)
20. There is sufficient evidence that Kant would *not* have accepted the characterization of atoms, molecules, etc. as substantial things-in-themselves. See, in this connection, for example, Langton 1998, pp. 207-08. [↑](#footnote-ref-20)
21. For a related, though more recent point of view, see Psillos’s discussion of Richard Boyd’s „explanationist defence of realism“ in Psillos 1999, pp. 78-81. [↑](#footnote-ref-21)
22. A more detailed reconstruction of the critical realist program would have to take into consideration the notorious rivalry between the ‘two-aspects view’ and the ‘two-worlds-view’ of transcendental idealism. Unfortunately, for reasons of brevity, I am only able to allude here to the fact that Riehl tended toward the first interpretation, while Külpe tended toward the second. This, in a nutshell, meant that, for Külpe, things-in-themselves constituted an autonomous class of entities being causally responsible for the ‘affection’ of observable appearances, whereas, for Riehl, things-in-themselves did *not* constitute a special class of entities but were merely the product of viewing appearances ‘in abstraction’ from the conditions of sensibility (cf. Riehl [1876] 1908, p. 562, where Riehl explicitly states that “the Critique teaches us to take the *same* object in two meanings, as appearance and as thing-in-itself”). Other advocates of the two-aspects view are Paton (1936), Prauss (1974), and Allison (1983). The two-worlds view, on the other hand, is defended by Vaihinger (1881/1892), Strawson (1966), Guyer (1987). See further Willaschek 2001, according to whom this whole discussion is essentially misguided. [↑](#footnote-ref-22)
23. For an extended discussion of Cassirer’s relationalist point of view, see Neuber 2012, pp. 137-155. See further Friedman 2005, pp. 73-77. [↑](#footnote-ref-23)
24. There seems to be an exception, namely the entry „Realism, critical“, in the second edition of the *Allgemeine Erkenntnislehre* (cf. Schlick [1925] 1974, p. 409). However, as one might expect, the index was not created by Schlick himself, but by his student Feigl. [↑](#footnote-ref-24)
25. Schlick himself refers the reader to Benno Erdmann as a “competent authority” ([1919] 1979a, p. 282) in interpreting Kant along realistic lines. See, in this connection, esp. Erdmann 1917. [↑](#footnote-ref-25)
26. Cf. Kant [1787] 1998, B 33: “In whatever way and through whatever means a cognition may relate to objects, that through which it relates immediately to them, and at which all thought as a means is directed as an end, is intuition.” [↑](#footnote-ref-26)
27. As Thomas Ryckman (1991, pp. 58-61) has correctly pointed out, Schlick’s conception of knowledge by coordination has one of its roots in nineteenth-century mathematics. Especially the work of Richard Dedekind, more precisely his account of function and number, is relevant in this connection (cf. Schlick [1925] 1974, p. 383). Yet, Külpe’s—psychology-based—contribution is, in my view, at least of equal importance as regards the Schlickian understanding of purely conceptual knowledge. For further details, see Neuber 2012, p. 75, fn. 91. [↑](#footnote-ref-27)
28. Cf. Schlick [1925] 1974, p. 238-39: “The fact that there are real things, some of which are given and some not given, may indeed justify us in distinguishing two classes of real things, but not in assuming two different kinds or levels of reality. Also, Külpe’s terminology allows the positing of an unconscious mental reality to seem more natural than is in fact justified, for it permits us, for example, to speak of sensations that are real ( = *real*) but at the same time are not also actual ( = *wirklich*). […] [T]here is no set of facts that either forces or justifies such a counterposing of two irreducible realities, of which one rests entirely on itself and the other is dependent on the first.” [↑](#footnote-ref-28)
29. Thus, as early as 1913, Schlick articulated the opinion that “if the concept of knowledge is correctly taken […], we ought in a certain sense […] to regard *any* knowledge that is not purely formal as a knowledge of ‘things-in-themselves’” (Schlick [1913] 1979a, p. 149). As I learned from Sean Crawford, the source of Schlick’s commitment to monism might be located in the *mind-body* problem. This assessment gets supported by Schlick’s remark—added in the preface to the second edition of the *Allgemeine Erkenntnislehre*—that, for him, the mind-body problem has “a quite special systematic importance” (Schlick [1925] 1974, p. xii). For further details, see Feigl 1971, Feigl 1975, Heidelberger 2007. [↑](#footnote-ref-29)
30. I must admit that I underestimated Cassirer’s possible impact on the early Schlick’s relationalism in my Neuber 2012. Thanks to Marco Giovanelli for instructive discussions concerning this point! [↑](#footnote-ref-30)
31. One must know in this connection that the manuscript of the *Allgemeine Erkenntnislehre* was already finished in 1916, so that it really makes sense to speak of an ‘application’ to relativity theory here. For further details, see Engler & Neuber 2006, pp. 36-37 and Wendel & Engler 2009, p. 75. [↑](#footnote-ref-31)
32. For similar assessments, see Bartels 1997, Friedman 1999, p. 20, Gower 2000. [↑](#footnote-ref-32)
33. I wish to thank Joseph J. Kominkiewicz who constructively commented on an earlier draft of this paper. [↑](#footnote-ref-33)