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American Pragmatism and the Vienna Circle: The Early Years

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Discussions of the relation between pragmatism and logical empiricism tend to focus on the period when the logical empiricists found themselves in exile, mostly in the United States, and then attempt to gauge the actual extent of their convergence. My concern lies with the period before that and the question whether pragmatism had an earlier influence on the development of logical empiricism, especially on the thought of the former members of the "first" Vienna Circle. I argue for a substantially qualified affirmative answer.

American Pragmatism and the Vienna Circle:

The Early Years

Thomas Uebel

1. Rudolf Carnap gave expression to what may be considered the standard view of the relation between logical empiricism and pragmatism.[1]

> "Logical empiricists from Berlin and from the Vienna Circle came into closer contact with pragmatism chiefly after they had come to the United States. A mutual understanding between the two schools was mainly fostered by Charles Morris and Ernest Nagel. Both attended the International Congress of Philosophy in Prague in 1934, where I became acquainted with them, and where they met their colleagues from Vienna and Berlin. Nagel was influenced by both movements, but avoided the application of any school label to his own view. Morris had the explicit aim of merging the two philosophical movements into one to which he sometimes applied the term 'scientific empiricism'." (1963b, 860)

This is easily read as confirming Herbert Feigl's later claim that "most of us in the Vienna Circle were largely ignorant of American philosophy" (1969a [1981, 69]). Thus we get the widespread view that pragmatism found no positive reception amongst the members of the Vienna Circle prior to their interaction with Morris and Nagel.[2]

I wish to argue for a revision of this view—not a radical revision but a significant one nevertheless.[3] I will do so without contradicting Carnap by stressing two words in his account: "clos-er"—meaning personal interaction—and "chiefly"—for not all members of the Circle were so affected. I will also do so without contradicting Feigl: the proposed revision does not require of the members concerned a significant knowledge of American philosophy as such. This does not mean, however, that according to the proposed revision there was only negligble impact from pragmatism on the Vienna Circle. The thesis, after all, is this. Pragmatist thought exerted a distinctive—if limited—influence on an important subgroup of the Circle around Moritz Schlick, namely, on the members of the so-called former first Vienna Circle: Philipp Frank, Hans Hahn and Otto Neurath.[4] Yet the story of "their pragmatism" is by no means straight-forward.

To begin with, there are a number of exegetical complexities that have to be navigated. First, there are retrospective remarks by Frank himself that are easily misread as denying any earlier influence to pragmatism at all. Add to this Schlick's early criticism of the pragmatist conception of truth and an ambiguous remark in the Circle's inofficial manifesto—alongside the well-known fact that, with the exception of the Viennese philosopher and pedagogue Wilhelm Jerusalem, pragmatism found little positive resonance among German philosophers until after the publication of the first volumes of Charles Peirce's *Collected Works* in the 1930s—and there seems to be no reason to challenge received view.[5]

As if that were not bad enough, there is also the issue of "which pragmatism" exerted its influence, given the differences among first-generation pragmatists in the first decade of the 20th century.[6] Here it is not enough to note that it was William James's version of pragmatism that Frank, Hahn and Neurath were familiar with ever since his *Pragmatism: A New Name for Some Old Ways of Thinking* was translated by Jerusalem into German in 1908. We must also note that pragmatist ideas were influential not only via

translated text but also more directly, through the thought not only of Jerusalem himself but particularly that of his fellow Viennese scientist-philosopher Ernst Mach—who, after all, was accorded pragmatist credentials by James in the book *Pragmatism*.[7] This somewhat selective—Peirce appears not to have been taken account of[8]—and diffuse nature of the pragmatism(s) they were aware of does not facilitate its detection in the works of (former) members of the first Vienna Circle.

Finally, there is the notable fact that it was not until the end of the 1920s and the early 1930s—importantly though still before 1934[9]—that Frank's, Hahn's and Neurath's sympathies for pragmatism were first affirmed in publications. Before then its influence remained largely unspecified as such.

If I try to unravel at least some of these complexities here, it is to be able to determine better than we can so far a certain long-term trajectory of Vienna Circle philosophy. Consider Frank's arguments from the early 1940s onwards for the closer cooperation between logical empiricists and pragmatists, even the fusion of logical empiricism and pragmatism.[10] Are they only to be understood as attempts at integration into the academic and intellectual scene of the country to which he had been exiled by the political developments in Central Europe? Or do they represent the outcome of a distinctive tendency within the Vienna Circle itself, a tendency the recognition of which may pay further dividends in other respects as well? To remove the stumbling blocks for the latter interpretation and so show the long pedigree, e.g., of Frank's later talk of "the pragmatics of science" (1957 [2004, 360]), I shall confront the problematic points mentioned above by way of specifying their early take on their pragmatism.

Even so, the present essay is hardly comprehensive. I must leave for another occasion an extended discussion of the "home-grown" pragmatism of Mach and Jerusalem, but can only stress the significance of a characteristic dictum of the former and touch on the not unproblematical anti-apriorism of the latter.[11] Likewise, the French reception of American pragmatism and its Austrian repercussions cannot be explored here. It would seem that Frank, Hahn and Neurath took James's references to the French conventionalists in *Pragmatism* at face value and that only Frank dug deeper later on.[12] I also must neglect discussing the possible subterranean influence of Ramsey and the role of Bridgman.[13] And I take as understood the already mentioned typically very negative reaction of German-speaking philosophers to pragmatist ideas, from their presentation at the Third International Congress of Philosophy in Heidelberg in 1908 by Jerusalem and the Oxford philosopher F.C.S. Schiller throughout the 1910s and 1920s.[14]

With these caveats in place I shall proceed as follows. After some general stocktaking, the disambiguation of some of Frank's relevant remarks and the documentation of his delayed advocacy of pragmatism, I will provide an explanation of pragmatism's two-stage reception by Frank, Hahn and Neurath. Three facors in particular are to be considered. There are the developments on their part towards a broader conception of philosophy of science than they had originally aimed for; there are the well-known difficulties of interpreting pragmatism's central doctrine and their solution; and there are the complexities of defending pragmatism against its apriorist opposition before the 1920s. In closing it will be noted that the pragmatist sympathies of Frank, Hahn and Neurath throw further light on the internal dynamics of the Vienna Circle in the 1920s and 1930s and on Frank's efforts in his American exile in the 1940s and 1950s to effect a closer cooperation between logical empiricism and pragmatism.

2. To begin with, let's briefly review Schlick's and Carnap's early attitudes to pragmatism. Neurath once reported that Schlick liked James's term "radical empiricism" (1946 [1983, 234]). But that, it seems was the extent of Schlick's appreciation. Already his habilitation contained an explicit refutation of the pragmatist conception of truth as outlined by William James and F.C.S. Schiller (1910-11 [1979, 63-68]).[15] For Schlick, they were mistaken in equating the criterion of truth with its nature and therefore, equally mistakenly, denying its timelessness and ascribing variability to it. This criticism was repeated, distilled to its essence, in his essay on causality in contemporary physics some twenty years later (1931 [1979b, 196]). To be sure, there are Schlick's broadly favourable remarks about Dewey's empiricism in his lecture to the Verein Ernst Mach about his 1929 visit to America (1930), there is his parenthetical remark noting a similarity between the Circle's verificationism and what "in Anglo-Saxon countries" was called "the experimental theory of meaning" (1932 [1979b, 265]) and there is the fact that his still later response (1936) to C.I. Lewis' "Experience and Meaning" (1934) simply bracketed the issue of truth.[16] But neither of these conciliatory gestures mean the revision of Schlick's vigorous opposition to the wholesale rejection of the correspondence theory by James and the pragmatists generally. After all, Schlick's own theory of truth as the unique coordination of statement and fact—which survived integration into the Wittgensteinian framework of his later philosophy—must be considered as a logically refined version of the correspondence theory in that it was stripped of the untenable attribution of qualitative comparability and insisted on a structural isomorphism between signs and signified.

It seems that Carnap too had misgivings against pragmatism, at least during his Viennese period before his move to Prague.

(Once in America with Morris as his colleague in Chicago, this changed, as the continuation of the passage from his autobiography quoted above shows.) Consider that in the correspondence with Neurath leading up the publication of *Wissenschaftliche Weltauffassung*, Carnap reported on his editorial decisions in producing what was the more or less final version as follows.

> "You see that I could not resolve to surrender unconditionally the opus that I formulated and typed in the sweat of my brow to other hands, and be they yours. Instead, I have, after all, reserved for myself the sour duty and the sweet right of the final formulation. … What I didn't take from you: … of the second [draft]: clarity of signs; imperfection of our language; induction; theory of constitution; what's real is what can be integrated; decisive action instead of pedantry; philosophy of the as-if; pragmatism. These things either already appear somewhere else in a different formulation or I had objections." (Carnap to Neurath, 26 July 1929, RC 029-15-14 ASP)

So the Circle's inofficial manifesto was meant to have included at least a reference to pragmatism by one of its authors, but Carnap vetoed it. To be sure, when early on in that manifesto there is talk of various "anti-metaphysical endeavours" in England and the USA, we can read that "in a certain sense James belongs to this group too" (Carnap, Hahn, Neurath 1929 [1973, 301]), but that can hardly count as a wholehearted endorsement. Given that there is no other mention of pragmatism "in a different formulation" in the manifesto, one must wonder whether Carnap had "objections".[17] What they were and whether they were substantive or strategic is difficult to determine in retrospect, given that Carnap did not elucidate his reasons in this or later letters to Neurath. Was it sympathy with Schlick's rejection of the pragmatist theory of truth? Or was it the realization that an appreciative mention of

pragmatism would not go down well with the very philosopher to whom the manifesto was to be designated? One may suspect that both considerations influenced him, but it is difficult to be sure.[18]

3. Let's turn to the former members of the first Vienna Circle. Late in his career, Neurath gave several retrospective assessments of influences. Speaking of himself, Frank and Hahn (and the more loosely related Richard von Mises) as having "been brought up in a Machian tradition", Neurath noted that "we ... were also influenced by scientists such as Poincaré, Duhem, Abel Rey, William James, Bertrand Russell" (1946 [1983, 230–231]). Similarly, he noted elsewhere that "I learnt much from Mach's writings, from Poincaré, Duhem, Enriques, Avenarius, later from Jevons, Abel Rey, James, Karl Pearson and Bertrand Russell" (1941 [1983, 217]). If the first list refers mainly to influences during his time at school and university, the second would seem to characterise influences from 1906 up to 1914. Elsewhere Neurath noted about the early Circle around Schlick that "it was now possible to coordinate" what members of the Vienna Circle had "developed individually under the influence of Mach. Avenarius, Poincaré, Duhem, Abel Rey, Enriques, Einstein, Schröder, Frege, Peano, Hilbert, Russell, as well as James and Nietzsche" (1936b [1981, 697]). This makes clear that by no means all members of Schlick's Circle shared the same influences. James would seem to be case in point.

This suspicion is reinforced by Neurath's note that among the philosophies taught at the Austrian universities—unlike in Germany where "the great systems erected by Kant Hegel, Schelling and other metaphysicians" were said to hold sway—were included "also utilitarianism, positivism, empiricism and pragmatism in their varied versions" and his mention among the representatives of these philosophies "in Vienna" of Wilhelm Jerusalem, the trans-

lator of James, as "a pioneer [*Vorkämpfer*, literally "vanguard fighter"] of the pragmatist point of view" (1936a [1981, 741–742]). Relatedly, in the small monograph *Le développement de Cercle de Vienne et l'avenir de l'empiricisme logique* Neurath noted, in the section dealing with how the distinctive "Viennese atmosphere" came into existence in the late 19th and early 20th centuries, that "the anti-metaphysics that Mach taught in Vienna did not stand alone" and that among the intellectuals not taken in by nationalist ideas, many "agreed with the ideas of liberalism, later also those of socialism, of utilitarianism, of pragmatism and of empiricism in varied admixtures" (1936b [1981, 691]).[19] Unlike Schlick and Carnap, then, by the mid-1930s Neurath was keen to count pragmatism among the influences on the development of Vienna Circle philosophy.

Such references are not proof of the influence of James or pragmatism generally on Neurath or Frank and Hahn, of course. Indeed, Neurath later cautioned that he intended no unambiguous canonisation and wrote: "I know very well how much we owe to James, but, on the other hand, he introduced this term, speaking of 'the substance of reality' as other people perhaps speak of the 'the area of New York'. James is also a supporter of a very Bergsonian attitude, which is foreign to empiricism." (1946 [1983, 234–235]; for similar criticism of James's metaphysics see his 1944, fn. 20) So we must consider the possibility that Neurath's remarks constitute a retrospectice assessment of the pre-war Viennese *Zeitgeist* without direct implications for what they were aware of at that earlier time.

4. In a retrospective account of the first Vienna Circle Frank wrote (in his first collection of translated essays): "At that time there was prevalent a strong aversion toward weaving into the philosophy

of science any considerations of a moral, religious, or political nature. Hence it was not realized that American pragmatism was a related movement, although at about this time a group of sociologists in Vienna came out in support of it." (1941, 7) Here Frank would seem to deny pragmatism any influence on the first Vienna Circle.

Before considering this further, note that Frank's account of what he also called "the ivory-tower attitude of the positivism of those days" (ibid.) appears to be contradicted by the account he gave eight years later of the discussions of the same group:

> "Our field of interest included also a great variety of political, historical and religious problems which we discussed as scientifically as possible. Our group had at that time no particular common predilection for a certain political or religious creed. ... Otto Neurath at that time even enrolled for one year in the Divinity School of the University in order to get an adequate picture of Catholic philosophy, and won an award for the best paper on moral theology. This shows the high degree of our interest in the cultural background of philosophic theories and our belief in the necessity of an open mind which would enable us to discuss our problems with people of divergent opinions." (1949a, 1-2)

A blatant discrepancy between these two passages would be avoided if the "ivory-tower attitude" mentioned in 1941 was a highly specific blind-spot. Let me suggest then that the specific blind-spot was their aversion to "weaving into" philosophy of science of "considerations of a moral, religious or political nature".

This is borne out by how Frank's 1941 passage continues: "The ivory-tower attitude of the positivism of those days is best seen from the fact that there was present in it even a certain appreciation of the vitalism of Hans Driesch." This remark needs to be un-

derstood in the light of the following facts. First, that during the 1930s Driesch's philosophical vitalism had become part of the loose assemblage of ideas that functioned as the ideology of German National Socialism[20]; second, that Driesch's work had found a sympathetic though critical reception in Frank's own "Kausalgesetz und Erfahrung" of 1907; and, third, that this early paper of his was reprinted in translation in the very volume in the preface to which the comment in question appears. It thus was a very specific failure that Frank singled out by the rather broad-brush term of "ivory-tower attitude", namely, the failure to appreciate what they did appreciate only later: that unless it is checked very carefully, talk of "organic totalities" easily serves racist ideologies. What Frank criticized in retrospect was that for all their interest in moral and political issues they still thought that philosophy of science remained untouched by them.

Yet what about the influence of American pragmatism at that time? First we need to see what Frank denied: not simple knowledge of it, but only that it was "a related movement". This raises the question of how Frank and his friends saw themselves before World War I. We just noted that Frank's story becomes consistent if we allow that at that time they tried to keep their own philosophy of science morally, religiously and politically neutral. Now we can add that, from this perspective, they plainly did not regard American pragmatism as a philosophy of science but as a *Weltanschauung*. Considering the version of pragmatism available to them at the time, we must concede that they were right: it was a *Weltanschauung* that in their eyes James presented over long stretches in *Pragmatism*! So Frank's account allows that the members of the first Circle knew about pragmatism, possible even felt sympathy for certain aspects, but stresses that they considered it

irrelevant for their work in philosophy of science strictly speaking.[21]

It may seem that this conclusion dispels any hope of substantiating the hypothesis that pragmatism influenced their philosophy of science. Here a response of some subtlety is required. The realization that pragmatism was a "related" movement required of the then future members of Schlick's circle not only a greater appreciation of the depth of the embedding of philosophy of science in the broader culture of its day, but also a change in their perception of the problem situation that pragmatism faced in order for it to play a role in the philosophy of science they wanted to develop. This means that we face a triple task: documenting a relevant broadening of the perspective of the members of the former first Vienna Circle, specifying the point of their appreciation of pragmatism and determining the problem that in their eyes pragmatism originally faced but that later on was recognized to be surmountable—thus explaining why it was not until relatively late in the day that they affirmed their sympathies in public.

5. Let's turn to indications in favour of the hypothesis of an earlier influence from pragmatism than commonly supposed. Consider first the big picture drawn by Frank of "the history of the development of 'logical empiricism'" in his first retrospective: "The movement developed through the cooperation of Central-European positivism with some groups representing American pragmatism. The European movement had its origin in the ideas of the Austrian physicist Ernst Mach." (1941, 6) The period of cooperation meant here I take to be that following the Prague conference in 1934 that Carnap marked, as we saw, as the beginning of his interaction with American pragmatists. For Frank, a significant milestone on the way towards that period of cooperation was

his opening address to the Congress of German Mathematicians and Physicists in Prague in September 1929. (This was a very large gathering of which Frank was the local organizer and to which he had managed to attach the much smaller First Conference for the Epistemology of the Exact Sciences at which the Vienna Circle and the Berlin Society for Empirical Philosophy introduced themselves to the academic public.) About this lecture and the philosophy he presented Frank noted:[22]

 "Here we find the synthesis of positivism and the new logic explicitly represented. It is also interesting that since the rigorously logical formulation of the positivistic ideas, their connection with American pragmatism has become clearly revealed; in this essay this connection is distinctly emphasized. The growing awareness of this congeniality was accompanied by a growing emphasis upon the fact that scientific theories are influenced by the social and political atmosphere. The ivory-tower attitude of the pre-war positivism had begun to crumble." (1941, 10)

This not only confirms that the "ivory-tower attitude" Frank criticized in their earlier selves had consisted in the neglect of the influence of the socio-political context of science upon its philosophy. It also tells us that by 1929 Frank too had become sufficiently "politicized" to realize that (as he put it yet another twelve years later) in Germany at the time "the philosophy of Kant and his metaphysical successors reigned, being regarded as a world picture particularly suited to the German nation" (ibid., 6). Frank's emphasis in that 1929 lecture on the connection with pragmatism thus carries a double meaning: not only the strictly scientific one of pointing out the convergence of certain doctrines, but also the political one of making common cause with pragmatism in its attack on the metaphysical depths (or swamps) which at the time

were widely upheld in right-wing popular and learned discourse as the distinctive virtue of the German mind over the shallow empiricism, positivism and utilitarianism of its Western neighbours.[23]

According to Frank's big picture in 1941 then, it was not until the second half of the 1920s that the "connection with American pragmatism" was recognized on the level of philosophy of science. But what prompted this recognition? Frank returned to the matter in his second account of the development of the Vienna Circle's philosophy (prefacing his enlarged second collection of essays) where the previously mentioned "rigorously logical formulation of the positivist ideas" which facilitated the recognition of the relevance of pragmatism was further specified. It consisted of two steps: first, Schlick's conception of cognition aiming at truth as unique coordination and, second, its adoption by Carnap. Let's consider the second step.[24]

"Schlick and Reichenbach had identified 'true cognition' with a system of symbols that indicated the world of facts uniquely. Carnap offered an example of such a system [in the *Aufbau*]. ... Carnap introduced as the elementary concepts of his system immediate sense impressions and the relations of similarity and diversity between them. The world is to be described by statements that may contain any symbols, provided that from them statements can be logically derived that contain nothing but assertions about the similarity and diversity between sense impressions. The 'meaning' of a statement in science would be the sum of all statements about similarity and diversity between sense impressions that can be derived logically from the statement in question. When I read this book it reminded me strongly of William James' pragmatic requirement that the meaning of any statement is given by its 'cash value', that is, by what it means as a direction for human behavior. I wrote immediately to Carnap, 'What you advocate is pragmatism.' This was as astonishing to him as it had been to me. (1949a, 33)[25]

As it happens, there is another interpretive puzzle here. In a letter of 7 October 1928 to Neurath, Carnap reported that he just received a postcard from Frank responding to the small booklet *Pseudo-Problems in Philosophy* (hereafter: *Scheinprobleme*) and he quoted: "What I find particularly interesting is the following. Logically trained thinkers who come from the exact sciences, like you for example, thus ultimately reach the same conclusion as the logically rather coarse pragmatist philosophy of W. James and others."[26] This raises the question whether Frank here misremembered what book of Carnap's had prompted his insight. This suspicion is heightened when we note that the verificationist criterion described in the last block quotation was not formulated in the *Aufbau* as such but only *Scheinprobleme* (1928b [2003, 327-328]). Frank in 1949 read back into the *Aufbau* what strictly speaking was not yet in it (though it accorded with it fully).[27] In any case, it was not until 1928 that the affinity between pragmatism's conception of meaning and the views of the Vienna Circle became plain to some members: only then did Frank—and the implication is: at least some his colleagues—appreciate the relevance of pragmatism for the philosophy of science the Circle was developing.[28]

To spell this out a bit further: what brought on this recognition was appreciation of the similarity between what James had called "Peirce's principle" and a certain reading of Carnap's *Aufbau*. Peirce's principle was: "Consider what effects, which might conceivably have practical bearings, we conceive the object of our conception to have. Then, our conception of those effects is the whole of our conception of the object" (Peirce 1878 [1992, 132]). The question arises: just what was meant by "effects with practical bearings"? James's paraphrase of the principle was this:

"To attain perfect clearness in our thoughts of an object, then, we need only consider what conceivable effects of a practical kind the object may involve—what sensation we are to expect from it, and what reactions we must prepare. Our conception of these effects, whether immediate or remote, is then for us the whole of our conception of the object, so far as that conception has positive significance at all." (1907 [1991, 23-24])

It seems notable that James referred to "sensations" alongside "reactions". In a similar fashion, Frank's "pragmatist" reading of the *Aufbau* stresses that the significance of "a statement in science would be the sum of all statements about similarity and diversity between sense impressions that can be derived logically from the statement in question", such that the reduction of the cognitive contents involved serves justificatory epistemological purposes (and not merely reconstructive constitutive ones). Frank's "pragmatist" reading of the *Aufbau* is, in fact, a verificationist-positivist one.[29]

6. Yet why, a sceptic might now ask, should we lend credence to Frank's story when there is doubt over the precision of his memory? The answer is that, apart from the possible infelicity noted, his story checks out. When we turn to his Prague address we find him writing, in building up to the aforementioned first step: "Like James Schlick begins with a determined rejection of the truth concept of school philosophy." (1929–30 [1949, 105])[30]

It may also be asked why it should have taken a verificationist-positivist reading of the *Aufbau* to prompt the appreciation of pragmatism. Did the members of the Vienna Circle not realize the affinity before? The answer would seem to lie, at least in part, in the fact that prior to *Scheinprobleme* the Circle simply did not have

an explicit verificationist criterion to speak of.[31] But more still was involved.

Carnap's verificationism represented what Frank had called "the rigorously logical formulation of the positivist ideas" (1941, 10). What precisely were the "positivist ideas" that Frank took to be so rigorously formulated by Carnap—was it just Mach's sensationalism as documented in his *Analysis of Sensations* (1886)? That would be to short-change the sophistication both of Mach and his first Circle readers and to over-ontologize the neopositivist doctrine. What must not be forgotten is Mach's dictum in *The Science of Mechanics*: "where neither confirmation nor refutation is possible, science is not concerned" (1883 [1960, 587]).[32] This dictum, of which his first Circle readers were well aware, stresses the epistemological point of positivism and it was this that was salient for Frank when he stated, concerning the aforementioned second step, that Carnap's *Aufbau* "made the most determined attempt" to give a rigorous logical formulation of the "doctrines of Mach" (1929-30 [1949b, 110]).[33] It was this aspect of the *Aufbau* that Frank associated with pragmatism. having the *Aufbau* (and *Scheinprobleme*) to hand clearly helped him to appreciate the similarity of their developing philosophy of science with that of pragmatism.

But now the other question arises with considerable urgency. If Frank saw the parallel to James's "cash-value" conception of meaning in the logically concise explication of Mach's dictum, why did he not appreciate the original parallel between the Machian and the Jamesian ideas? Here the answer is that he may very well have done so, but that in his perspective the distinction of Vienna Circle philosophy lay precisely in the logical sophistication that it gave to the positivism and the pragmatism of the previous generation. In his Prague address Frank remarked critically about both Mach and James that their pronouncements remained

sketchy and "indefinite".[34] So it was not simply the parallel between Mach and James that mattered since Frank wanted to stress the advance beyond them.[35] What mattered was precisely that Carnap's criterion of empirical significance allowed one to discern in logically concrete terms the cash-value, as it were, of Mach's and James's earlier merely programmatic pronouncements on meaning and truth.

That Frank's type of positivist reception of the *Aufbau* was somewhat problematical not just on the Carnapian but also on the Machian side of the equation may be noted but does not affect the dynamic at issue here.[36] (Likewise, the similarity with pragmatism was more limited than Frank cared to advertise at the time, given that James in particular failed to make use of the anti-metaphysical cutting edge of Peirce's principle.)[37] Likewise we should note that Schlick took a different route by his association of Carnap's *Aufbau* project with Wittgenstein's *Tractatus* (see his 1926 [1979, fn.2]). So Frank's report sheds light not only on the development of the Circle's theses still prior to its public phase from the 1929 Prague conference onwards, but also on some of the Circle's early internal dynamics.

7. Yet this still leaves us to assess the nature of the first Circle's reception of pragmatism. Given the widely reported largely critical discussions of the pragmatist theory of truth at the International Congress of Philosophy at Heidelberg in September 1908, it is unlikely that they did not take note of it already then. It becomes wholly implausible to suppose so once it is noted that Jerusalem gave a talk entitled "Der Pragmatismus: Eine neue philosophische Methode" (Pragmatism: A New Philosophical Method) on 24 January 1908 to the Philosophical Society of the University of Vienna, in which all three of Frank, Hahn and Neurath were active.[38] As a

philosophy of a more general *weltanschauliche* sort certain parts of James' pragmatism may well have struck a responsive chord in them, while certain others repelled them. This is clearly evident in the case of Neurath.

Already in October 1909 Neurath had published a brief review of James' *Pragmatism* in Jerusalem's German translation as part of a review of the book series in which it appeared. There he commented on the unclarity of what's meant by talk of "practical consequences".[39] His awareness of James's work is also documented by passing remarks (e.g.. Neurath and Schapire-Neurath 1910 [1998, 414]) including one on the contemporary "fashion" of the "urban intelligentsia" to appreciate the philosophies Bergson and James as ones that "oppose the rationalism of the previous period" (1914 [1998, 351]). More significant, however, is what appears to be an embrace of certain pragmatist ideas in his 1913 lecture to the Philosophical Society at the University of Vienna, "The Lost Wanderers of Descartes and the Auxiliary Motive". There Neurath claimed against Descartes that "the differences between thinking and action are only of degree, not kind" and rejected his view "that only in the practical field could [we] not dispense with provisional rules" (1913a [1983, 2-3]). The fallibilist epistemological holism and the model of decision-making under uncertainty that Neurath developed and contrasted with "pseudorationalism" there is clearly of a pragmatist cast.[40] (Neurath expressly rejected the idea that a thinker could wipe clean the slate and begin anew from scratch on a basis of certainty: the tasks ahead pressed us forward to make decisions, not only in daily life and action but also in theoretical thought, without the assurance of any supposedly superior insight.) While the term "pragmatism" was never mentioned, it is notable, for instance, that it's an auxiliary "motive" that Neurath invoked for decision making, not an auxiliary

hypothesis. Fittingly, Neurath's first employment of the simile so beloved by Quine—of the sailors having to repair their boat at sea—falls into the same year (1913b [1998, 215-216]).

Likewise, pragmatism's reputed "voluntarism" [41] fitted well with Frank's radical conventionalism in his early paper on causality which Frank once characterized as representative for their early views (1941, 8). Frank suggested that the principle of causality was a mere convention adopted only for its convenience in formulating workable theories. He concluded that "experience only serves to fill in a framework which man brings along with him as a part of his nature", but whereas "the old philosophers considered this framework a necessary outgrowth of human organisation", he saw in it a "free creation of human imagination" (1907 [1949a, 58]). Cantor's famous formulation was here married to a radical voluntarist conventionalism which Frank later withdrew from but which also possessed strong pragmaticist overtones and clearly owed more to Le Roy than Poincare or Duhem. Fittingly enough, Le Roy was referred to glowingly in James's own preface to *Pragmatism* whereas Poincaré and Duhem were mentioned only later in the text. Still, Frank's paper was published in the same year as *Pragmatism,* so James's reference is unlikely to have played a role. Frank mentioned "the pragmatism so popular in America" for the first time only in a review the mid-1910s (1915, 47), namely of Hans Kleinpeter's *Der Phänomenalismus. Eine naturwissenschaftliche Weltanschauung* which sought to establish an affinity between Nietzsche's thought and pragmatism.

Of course, none of these comments and partial parallels—even less so Hahn's then silence on the matter—amount to an endorsement of pragmatism. That nevertheless some sympathy with selected aspects of its doctrine is detectable still fits with Frank's

claim that in the first Circle pragmatism was not yet understood as "a related movement".

8. For the early years of the Vienna Circle proper, Frank's retrospective accounts appear broadly corroborated already by Neurath's attempt to discuss pragmatism in its manifesto. That Carnap vetoed it, however, leaves one wondering whether he was as enthused by Frank's discovery of the *Aufbau's* pragmatist credentials as was Frank himself. Be that as it may, Neurath's intention to bring pragmatism into play was realized by Frank's opening address to the 1929 Congress in Prague to the text of which we may now return briefly.

In recommending the Circle's "scientific world-conception" to the assembled physicists in place of their homespun philosophies that had been rendered redundant by physics itself, Frank laid considerable stress on what he expressly called "the close relationship between the truth concept of the modern logical movement and that of pragmatism" (1929-30 [1949b, 112]). This assertion followed on the heels of his explication of Carnap's criticism of metaphysics as making use of unconstitutable or non-constructable concepts, thus failing to provide "a specifiable relation between concrete experiences" (ibid.). Earlier Frank had claimed that "the physicist in his own scientific activity has never employed any other concept of truth than that of pragmatism" (ibid., 102). He illustrated this, first, by claiming that "the 'agreement of thought with its object' ... cannot be established by any concrete experiment" and stating, with Mach and James, that it is only possible to "compar[e] experiences with one another" (ibid.). Later he rendered this conception more precise by employing Schlick's notion of truth as unique coordination, understood as "the unequivocal assignment of a system of symbols to experiences" (ibid., 106), in

explicating instances of hypothesis confirmation.[42] Also notable is that Frank's *The Causal Law and its Limits* begins with reflections about the nature and purpose of "the instrument 'science'" (1932a, title of Ch. 1, Sect.1) and that Frank noted with obvious agreement Bergson's view that the conception of scientific statements as invented instruments constitutes the core of James' pragmatism (ibid., 281 fn.1). Indeed, James had openly declared: "*Theories ... become instruments, not answers to enigmas in which we can rest.*" (1907 [1991, 26, orig. emphasis]).[43]

Both of these pragmatist points find expression also in the writings of Neurath and Hahn. Neurath's own paper at the smaller 1929 Prague conference contains the eminently pragmatist-sounding credo:

"Our thinking is a tool, it depends on social and historical conditions. ... We cannot act as prosecutor and defendant at the same time and in addition sit on the judge's bench. We confront our present thinking with our earlier thinking, but we have no possibility of taking a judge's stand on a point outside." (1930 [1983, 46])

Here pragmatism's anti-correspondentism and instrumentalism appear intimately connected. Hahn also—albeit not until some public lectures in 1932 (his lecture at the Prague conference concentrated on presenting the Wittgensteinian conception of logic as tautological and its consequences)—gave public expression to his "allegiance to the pragmatist conception", namely its conception of truth: "The truth of a statement consists in its confirmation. Of course, this robs truth of its absolute, eternal character, it becomes relativized, humanized, but the concept of truth becomes applicable!" (1933 [1987, 43, trans. altered]) In a footnote Hahn then quoted from Jerusalem's translation of James's *Pragmatism* and from a paper in the Dewey-edited volume *Studies in Logical Theory* (which was referred to in the Preface of James's *Pragmatism*).

I'll return to discuss the problematical aspects of Frank's, Hahn's and Neurath's pronouncements on truth below. Now I simply note that not only Frank but Neurath and Hahn also found it easy to link what James called "Peirce's principle" to their own developing criterion of empirical significance and their critique of the traditional correspondence conception of truth. Their long exposure to Mach's proto-pragmatic dictum had paved the way.

9. I turn to the issue of the delayed appreciation of pragmatism under its own name. That Frank and his friends had become more aware of the close relation between science and its philosophy and the socio-cultural and political environment in which it was practiced and so had come to appreciate better the kinship of their battles against school philosophy—especially, as Frank stressed, against its conception of truth—is unlikely to be the whole explanation.[44] We already noted that for them James's *Pragmatism* was not an unproblematic doctrine. Being promoted as a *Weltanschauung* was only one aspect of this, however. To get a deeper insight, we may consider the philosophy of the spokesperson for pragmatism in Vienna, Wilhelm Jerusalem.[45]

Certain aspects of Jerusalem's work were problematic for future members of the Vienna Circle whether or not they appreciated his pragmatism. Schlick's *Gedenkrede* for Jerusalem serves as a good example for it. Schlick explicity noted Jerusalem's "attempt to answer several of the questions of logic and epistemology on a psychological, later even sociological basis, which barred him from doing full justice to them" (1928 [2008, 140]). Jerusalem occupied a particularly exposed position in the turn-of-the-century German debates about the ground of the validity of logic.[46] He

espoused a variant of what has come to be known as psychologism, the view that the validity of logic was ultimately of empirical origin, the laws of logic representing merely evolutionarily beneficient dispositions of human thought. His *Der kritische Idealismus und die reine Logik* (1905), published only three years before his translation of James's *Pragmatism*, was a sharp polemic against the apriorist opponents of this view, as was his own lecture at the Heidelberg Congress where he characterized his "evolutionist" position as follows (implicating also his friend Mach):[47]

> "Even the most universal propositions of logic and mathematics are regarded only as sedimentations, as condensations of earlier experience. The evolutionist sees in these propositions the adaptation of thoughts to facts and to each other (Mach), he finds in these valuable tools from the point of view of the economy of thought." (1909, 809 trans. TU).

Though logically independent from pragmatism when that is viewed as centred on Peirce's principle, at the time Jerusalem's psychologistic position also played into the reception of pragmatism on account of the James's own thorough-going anti-aprioricism.[48]

The question whether James was committed to psychologism was not widely asked but Jerusalem's position was taken to be representative. In *Pragmatism* James only claimed that "the form and order" of "those bodies of truth known as logics, geometries, or arithmetics" is "flagrantly man-made" and that "mathematics and logic themselves are fermenting with human rearrangements" (1907 [1991, 108 and 112]). This is not decisive, but since Jerusalem argued along similar lines to press his psychologistic conclusions, and James gave no grounds to argue against these, it was not an unreasonable conclusion to associate pragmatism and psycholo-

gism. Certainly what F.C.S. Schiller wrote in the Preface to his second collection of essays fully legitimates still wider conclusions: "Various forms of 'psychologism', proceeding from the same considerations as those which have inspired the Anglo-American pragmatisms, disturb the older conceptions of logic. Among them Prof. Jerusalem's *Der Kritische Idealismus und die reine Logik* is particularly noteworthy" (1907, xii).[49] Note then that until a different alternative to apriorist rationalism became available, pragmatism's anti-apriorism was stuck with psychologism. For theorists attracted by Russellian logicism—like Hahn, Frank and Neurath already in the first Vienna Circle—and with it its conception of logic as concerned with a mind-independent domain, this marked a serious deficiency of pragmatism when it was considered for its suitability as a philosophy of science.[50]

It is important, however, to note that Jerusalem's psychologism did possess some redeeming features. For besides the question of what justifies the validity of logical laws which we nowadays remember as the decisive one in the psychologism debate, there were also other issues tied into it on which Jerusalem's opponents by no means stood on as firm a ground as on the former. Typically, these opponents' conceptions of the a priori nature of the validity of logical laws went hand in hand with a certain conception, first, of their truth pertaining to a distinct ontological realm, and, second, of the timelessness of the human reason that discerned these laws. As to the first point, Jerusalem's report of the Congress at Heidelberg simply heaped scorn on the idea that such a self-sufficient "third realm between experience and metaphysics" with its intrinsic modality should provide the ground for normative conceptions of human knowledge and science (1908b, 59). Thus he stressed that science successfully employs abduction, despite the bar placed by formal logic on the fallacy of *post hoc*

propter hoc: Jerusalem rightly pointed out that scientists do not assume that the truth of abductive inferences is necessary (ibid., 60). As to the second point, Jerusalem reasoned that if the laws of logic indeed were eternal laws of thought, then the thought that discerned their justification had to partake of that eternality. Thus he criticized as "essential in all epistemological apriorism" the "unshakable belief in the timeless and wholly invariable logical structure of the human mind" (e.g. 1922, 69) which made our knowledge of these laws a "gift of mercy from God" (1914 [1925, 192])—a view he took to be patently refuted by ethnological and anthropological research. That some apriorist opponents granted the legitimacy of evolutionary accounts of human reason left Jerusalem puzzled.[51] He should have argued, but did not, that whether the laws of logic pertained to a timeless realm of reason or not, no good account of our a priori knowledge of them had been provided.[52]

Jerusalem naturalistic approach to human cognition can be accused of failing to take proper account of the difference between questions of the origin and the validity of logical thought, and of the descriptive and normative import of the laws of logic, but this does not invalidate as unwarranted his opposition to apriorist rationalism. (Still in the 1930s and 40s and entirely independently of Jerusalem or psychologism, American pragmatists argued against ontological conceptions of logic.)[53] Yet at the time pragmatism's assault on metaphysical speculation and its evolutionary deflation of philosophical categories was all too easily deflected by reference to these failings and sympathisers of pragmatism who were not attracted by psychologistic shortcuts were confronted by the problem that had beset empiricism all along: how to account for logic and arithmetic and our knowledge of it.

To this problem the Vienna Circle around Schlick had a ready answer, however—unlike the first Circle before World War I. Following Wittgenstein who had introduced the idea that the laws and propositions of logic are purely tautological, the Vienna Circle had a distinct advantage over both parties of the psychologism dispute: their own apriorism vis-à-vis logic required no more than the grasp of linguistic rules.[54] Now the pragmatist sympathies of (some of) its members no longer faced the objection that the earlier generation of pragmatists was faced with. The previously perceived conflict of doctrines now was resolved and affirmation of their pragmatist sympathies became possible.[55]

10. On what points then did Frank, Hahn and Neurath endorse pragmatism? Two such are clearly discernible. First, the view that scientific statements and theories are tools and instruments; secondly, the conviction that any talk of truth must be grounded in confirmation. Both of these points imply a negative thesis: truth as correspondence of statement and fact and scientific knowledge as faithful copying of a world independent of the inquirer are metaphysical ideas, that is, correspondence truth and realism postulate representational relations that we are in no way able to check up on.[56] But it is important also to see the positive thesis that is entailed by these two points: science provides us with maps and models that we are justified to rely on for our activities as long as and to the extent that they have been confirmed by experience or experiment. So the denial of correspondence and realism does not rob science of its objectivity which, importantly, is understood not as what an ideal spectator would see that we cannot, but instead as evidence-based intersubjective agreement.

What is notable in Frank's, Hahn's and Neurath's appropriation of pragmatist ideas is therefore that it went beyond the appre-

ciation of the *de facto* (ultimate) action-orientation of all thought (stressed by James) and its evolutionary roots (stressed also by Mach and Jerusalem). It went beyond aiming for a more practical, life-oriented philosophy and embraced the radical conclusion that any other way of orientating our thought than by assessing it in the light of Peirce's principle is simply impossible. In terms that Frank quoted from Bergson, science does not discover its true statements but "invents" them (1929-30 [1949b, 102]). Yet as Bergson also pointed out (as Frank noted), there is no adventitiousness in this process of invention—though there clearly is underdetermination involved—given "the presence of resisting factors in any actual experience of truth-making, of which the new-made special truth must take account, and with which it has perforce to 'agree'", as James had put it (1907 [1991, 107]).

Yet Frank's, Hahn's and Neurath's appropriations of some pragmatist points were not unproblematical. To begin to see this, note that Frank also used Bergson's allusion to James' phrase of the "core" and "man-made wrappings" of reality (1907 [1991, 109]) in his description of traditional theories of truth to make a telling point. If "the whole work of science consists in breaking through the obstructing husk of facts, in the interior of which the truth is housed like a nut in its shell", then it becomes "difficult to distinguish between sensible and meaningless formulations of problems, for to every question the answer can be found behind the husk of facts if one bores with sufficient energy." (1929-30 [1949b, 95]) As an alternative view Frank then reported Schlick's rejection of truth as agreement of thought with its objects as paralleling James's and outlined his conception of truth as unique co-ordination between symbolic statements and facts (see §5 above). "It is easy to convince oneself", Frank concluded, "that physical cognition consists in the unequivocal assignment of systems of symbols to experiences" (1929-30 [1949b, 106]). Notably, Frank's paper later prompted a rejoinder by Schlick (who had not attended the Prague congress) in the Circle meeting of 5 February 1931: "Positivism does not speak of the 'invention' but the 'discovery' of truth—like what Frank calls 'school philosophy'" (in Stadler 1997 [1981, 246]). Clearly, Schlick was not pleased to have been placed in such close proximity to pragmatist theories of truth as he was by Frank.

Hahn for his part referred the reader to a passage in Jerusalem's translation of James' *Pragmatism*: "What counts as true is", as he put it, "what works best in the way of leading us, what fits every part of life best and combines with the collectivity of experience's demands." (1933 [1987, 282, fn. 18]).[57] Note that James' own "[Pragmatism's] only test of probable truth is", which prefaced the phrase "what works best…", became "As acceptable truth counts only" in Jerusalem's translation of it (1907 [1908, 51]), which was then further shortened by Hahn as above. That important distinctions were glossed over rather flagrantly here calls for comment (if not explanation). To begin with, Hahn, like Frank (and Neurath), came close to conflating accounts of what truth is with criteria by which it is detected.[58] But this also suggests that Hahn, like Frank (and Neurath), was not so much interested in what the pragmatist conception offered by way of a positive definition of truth, but in what it helped to oppose: in Hahn's words, "the old metaphysical conception" such that truth consists in the correspondence of what a statement says with a "world of true being" (1933 [1987, 42]). What ultimately mattered was that all of the sciences knew only "one criterion of truth: confirmation" (ibid, 44). The point was to determine what can be "counted as" true, not to determine what truth really consists in—thus Hahn's quotation from the Dewey

volume: "That which can safely be taken for granted as a basis for further action is regarded as real and true." (Ibid., 282, fn. 18)[59]

Both Frank and Hahn were not concerned with what truth is. Like Neurath whose remarks like "A statement is called correct if it can be incorporated into [the totality of existing statements that have already been harmonized with each other]. What cannot be so incorporated is rejected as incorrect" (1932a [1983, 66; insertion taken from previous sentence]) are often misunderstood as putting forward a coherence theory of truth, Frank and Hahn also did not put forward the thesis that truth is confirmability. What either were concerned with was the criterion by which we may recognise those statements that we commonly call true. Neurath would have liked to do without the notion of truth altogether; Frank and Hahn, it now seems, were not far off his position in being only concerned with its operationalizable aspects.[60] It may be added that none other than Einstein expressed this concern when he ended his Preface to Frank's *Relativity: A Richer Truth* with the words: "Wahrheit liegt in der Bewährung. Truth is what stands the test of experience." (1950, 10)[61] Clearly, Einstein should not be read as giving a definition here either; the point is rather that in rejecting metaphysical notions of truth Einstein here made common cause with Hahn, Frank and Neurath—and perhaps to some degree with pragmatism. Of course, Hahn's, Frank's and Neurath's pragmatism could have been saved from any appearance of conflating truth and confirmation by Tarski's semantic theory of truth—if that is read as explicating a deflationist conception—when it became known to the Circle in 1935, as in effect Carnap then urged. But Hahn had died the year before and Neurath refused, suspecting metaphysics. Only Frank quietly came on board but left Carnap to his logic of science and pursued the pragmatics of science himself.

In sum, Hahn, Frank and Neurath agreed with pragmatism (as they now preferred to understand it) in rejecting inquiries into the nature of truth and focusing solely on the cash-value of that concept—confirmation. Their nowadays scandalous-sounding pronouncements on truth need not be taken as evidence for confusing truth and confirmation but instead for having taken on board the pragmatist criticism of correspondence notions of truth. Even so, they concluded somewhat rashly—as we can see, after Tarski—that the only way to make sense of the notion was to operationalize it. Having staved off pragmatism as irrelevant to philosophy of science until they were able to replace its psychologistic opposition to apriorist rationalism by the new conception of logic as tautological, the former members of the first Vienna Circle pragmatized truth to the point of disfiguring even Schlick's conception of it. (Recognition of their reception of pragmatism seems essential to interpreting their problematic stance on truth in the late 1920s and early 1930s correctly.)

11. Noting these agreements must not mislead us to think that in the years before 1934 the former members of the first Vienna Circle provided wholesale endorsements of pragmatism. Elsewhere Frank remarked critically about the "pragmatist school which made the fight against the metaphysical conception of truth its main task": "But the pragmatist formulation of the aim of science is not satisfactory because it often contains an insufficient appreciation of the value of logic and systematicity in science." (1932b, 151) Even so, the evidence adduced points to the conclusion that the positive reception of pragmatism by some members of Schlick's Vienna Circle, while qualified and partial, happened earlier and was broader than commonly supposed.[62] In particular, concern with pragmatism did not only arise with the attempts at

internationalisation around 1934 when first contacts were made with American philosophers like Charles Morris and Ernest Nagel. It would be equally wrong to suggest that strongly pragmatist ideas were only embraced in 1932 by way of a flight from foundationalism. Nor was Feigl correct to say of the Circle ca. 1929 that "it was only some years later that the Viennese positivists realized their kinship of outlook with that of the American pragmatists" (1969b [1981, 22]). Already in 1928 pragmatist sympathies fuelled Frank's enthusiasm for the Circle's own pre-Wittgensteinian verification criteria—sympathies which found provocative expression in his plenary address one year later—with Hahn and Neurath not far behind.

Frank's, Hahn's and Neurath's delayed public appreciation of elements of the pragmatism they first encountered many years earlier followed on from two separate developments. Those were, first, that Wittgenstein's conception of logic saved not only empiricism but also pragmatism and, second, that Carnap's *Aufbau* and *Scheinprobleme* made precise James's vague talk of the cash-value of statements. Two very well-known staging posts of early logical empiricism thus possess significance also for the relatively early embrace of pragmatism by some members, but they are hardly sufficient to explain it. That embrace, however partial, also was no mere academic or personal rediscovery but also represented a political act outside of the "ivory tower" that, as Frank noted, early on had still contained their thinking about science and its philosophy. Making common cause with pragmatism in 1929 was of a piece with the Circle's contemporaneous inofficial manifesto which claimed to bear witness to "how the spirit of the scientific world conception penetrates in growing measure the forms of personal and public life, of education, of childrearing, of architecture,

and how it helps shape economic and social life according to rational principles" (Carnap, Hahn, Neurath 1929 [2012, 90]).

In light of all the complexities involved, however, it is not unproblematic to speak of Frank, Hahn and Neurath as having been "influenced" by Anglo-American pragmatism. The anti-scholastic spirit of its philosophizing appears to have been valued early on, albeit counterweighed by strong misgivings over James's metaphysical tendencies and the psychologism associated with their overall naturalism. Neurath's remarkably pragmatist-sounding 1913 essay may be best understood as expressing a sense of affinity that was fed by a variety of sources not the least of which was the naturalism of Ernst Mach (so valued by James). This affinity deepened over time and was shared, especially once the psychologism issue was resolved, not only by Frank but also by Hahn—by which time their fully-fledged logical empiricism self-consciously called upon pragmatism as an ally in its ideological struggle against German "school philosophy". The direct influence of American pragmatism appears to have been rather diffuse and later appeals to it partly instrumental.

Even so we must note that the division in the Vienna Circle around Schlick between its "more conservative right wing" and its "left wing"[63] runs to a large extent (Carnap requires a somewhat modified story) along the lines of rejection or acceptance of the pragmatist opposition to correspondence theories of truth and spectator theories of knowledge. This points to the significance of the early pragmatist sympathies for the development of the Vienna Circle and underlines the continuity of certain doctrines—like Frank's "pragmatics of science" and Neurath's earlier related efforts—that contradict the still all too familiar stereotype of logical positivism.[64]

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Notes

1 For the relation between Vienna Circle philosophy and pragmatism generally, see Dahms (1992) and (1997), Reisch (2005), Mormann (2014). For detailed analyses of various aspects of Carnap's relation with pragmatism in particular, see Carus (2007), Mormann (2007), Richardson (2008) and Limbeck-Lilineau (2010); for a discussion of Frank's attitude towards pragmatism during his period of exile, see Uebel (2003), of his pragmatist form of anti-metaphysics, see Uebel (2011).

2 One partial exception to this view is Cheryl Misak who noted, with reference to Neurath, Hahn and the later Carnap in the early mid-1930s, that "at the end of the day, those logical positivists who were not caught in the phenomenalist bind of upholding objectivism while being committed to subjectivism turned to pragmatism and a non-transcendental or human-centered account of truth" (1995, 96). Since she considers it to have been "one of the important initial aims of logical positivism" to complete "the quest to ground knowledge in something about which we cannot be mistaken" (ibid., 92), she sees a clear trajectory from foundationalism to pragmatism. The picture developed here rejects the attribution of foundationalism to Neurath (and the Carnap of the *Aufbau*) as background assumptions; moreover, it differentiates for their pragmatist sympathies between the personnel of the physicalist wing of the Circle which Misak groups together. Misak (2013, Ch. 9) is concerned with a later period where she sees "no clean break between pragmatism and logical empiricism" (ibid., 175), but that period is not at issue here.

³ For an argument along somewhat different lines against the common view, see now Ferrari (forthcoming).

⁴ On the first Vienna Circle, a pre-World War One discussion group including Philipp Frank, Hans Hahn and Otto Neurath, see Frank (1941, 7–8), (1949a, 1–3), Haller (1985), Stadler (1997 [2001, 143–161]) and Uebel (2000).

⁵ On the German reception of pragmatism see Oehler (1977), Joas (1992), Dahms (1992), Ferrari (2006) and Uebel (2014).

⁶ Peirce's 1905-1906 papers in *The Monist*, criticizing James's use of his principle of significance, were explicitly referred to in a critical contribution by Paul Carus on F.C.S. Schiler's paper at the Third International Congress of Philosophy in Heidelberg in 1908 (see Elsenhans 1909, 737). Hookway (2008) provides a succinct description of the difference between Peirce's "logical" and James's "psychological" approaches.

⁷ James referred approvingly to Mach three times in connection with his own rejection of the traditional correspondence conception of truth (1907 [1991, 28, 84, 97]); in the German translation Jerusalem identifies one of these references in an added footnote and adds another pointing out the parallel between James's view of concepts and Mach's of laws (1907 [1994, 120, 169]). In return it should be noted that despite his admiration for James's work in psychology Mach himself expressed reservations about James's pragmatism in 1911 (quoted in Ferrari 2010, 78, fn. 12).

⁸ This in line with the German reception of pragmatism generally—despite the recognition of Peirce as a logician in Schröder (1890–1905). For instance, while Schlick mentions Peirce and Dewey, alongside James and Schiller, once in his (1918), his extended critical discussion in (1910–11 [1979, 63–68]) only refers to James (1907) and Schiller (1911).

⁹ There are no indications that Sidney Hook had any interaction with the Vienna Circle, despite the favourable characterisation of their role in the Germanophone academic landscape in his (1930) which, however, was picked up by the editors of *Erkenntnis* and partly reprinted in translation in vol. 1, 83–87.

¹⁰ For representative programmatic quotations see Uebel (2003), for applications see Uebel (2011).

¹¹ On Mach's philosophy generally see, e.g., Haller (1981) and (1988), on his "pragmatism" see Uebel (2014). On Jerusalem see Jerusalem (1922), (1925b) and Eckstein (1935). Recent mentions and brief discussions of Jerusalem's work in works on the Vienna Circle can be found in Stadler (1982) and (1997 [2001]), Haller (1993), Uebel (2000) and Ferrari (2009). For discussions of the role of Jerusalem in the transmission of pragmatism generally, see Ferrari (2006) and (2010) and, alongside his role in the inception of the sociology of knowledge, Uebel (2012).

12 For an overview of the European reception of American pragmatism see Shook (2006). For an older overview of the French reception of pragmatism in particular see Allcock (1983, xxv-xxxiii), for a recent discussion of the French and Italian reception see Ferrari (2014). In sections 8 and 10 below, we shall see that Frank quoted with approval from Bergson's Introduction to the French translation of James's *Pragmatism*. Already Jerusalem (1913, 3215-3217) briefly discussed the relationship between Bergson's and James's philosophies and distinguished the former's metaphysics. For an extended discussion of the difference between pragmatism and French voluntarism generally, see Stebbing (1914).

13 That Ramsey's appreciation of Peircean ideas may have had an influence on Wittgenstein's fast developing ideas after his return to philosophy which in turn influenced Schlick was noted in passing in Dahms (1997). On Ramsey's pragmatism see Galavotti (2014). For a brief comment concerning Bridgman's supposedly pragmatist credentials, see fn. 16 below.

14 See fn. 5 above.

15 How far Russell's (and Moore's) opposition to James (and Schiller) influenced Schlick is difficult to say. His (1911) references Russell but not his criticisms of James.

16 To be sure, whether Schlick's reference to "the experimental theory of meaning" is to Dewey or instead to Bridgman's operationalism in (1927) which Schlick reviewed and criticized in his (1929) must remain an open question here. Most notably, however, Bridgman did not characterize himself as a pragmatist there and neither did Schlick in his review nor Frank in his later retrospectives—nor, for that matter, any of the discussants of "the present state of operationalism" (including, again, Bridgman himself) in Frank (1956, Ch. 2). Blumberg and Feigl instead assimilated his "operations" to Reichenbach's coordinating definitions (1931, 289) as did Frank (1949a, 44).

17 On the production and earliest reception of the Circle's inofficial manifesto see Uebel (2008).

18 Limbeck-Lilienau (2010) points out that the *Aufbau* mentions James in §162 and Dewey in §59, respectively for their stance on neutral monisn and behaviourism—albeit without a specific references and evidently so prompted by Russell (1921)—and in §3 also Lewis (1918) which is also cited in (1930) alongside Peirce (1870). I note that all four of these pragmatists were mentioned for specific scientific positions or achievements, not for being representatives of the philosophy of pragmatism.

19 Neurath immediately added: "The proportion of those that clearly advocated this anti-metaphysical tendency was surely more significant than in German university towns; a comparative study on this would of great interest." (1936b [1981, 691])

20 See Zilsel (1933 [1992, 168]) who noted that Driesch himself was nonetheless dismissed from his post by the Nazis in 1933.

[21] Here the apparent obscurity of Peirce gives pause again. Neurath was familiar with Schröder (1890-1905) where Peirce was frequently mentioned. Either the identity of the pioneering logician with the author of what James called "Peirce's principle" (see §5 below) escaped him or was never followed up.

[22] The lecture was published as Frank (1929-30) and is discussed below (§§6 and 8). Its original German title reads "The Significance of Contemporary Physical Theories for the General Theory of Knowledge" but its translation appeared as "Physical Theories of the Twentieth Century and School Philosophy".

[23] In the "Oral History Transcript" of his interview by Thomas Kuhn, Frank (1962) identified the physicist Arnold Sommerfeld (who gave another plenary address at the Congress) as one such nationalist opponent who was particularly upset by the connection Frank drew between what in his lecture he called Mach's and James's "criteria of truth".

[24] The first step was this: "From [his] analysis of scientific theories Schlick proceeded to the claim that every cognition, in whatever domain of knowledge, is essentially the establishment of a correspondence [coordination, TU] between the *facts of the world* and a *system of symbols*. Since between these symbols a set of relations—for example, the axioms of geometry or mechanics—is established, an arbitrary correspondence [coordination, TU] would frequently assign several worlds of facts to the same set of symbols. Then the cognition is false. According to Schlick, a cognition is 'true' if the correspondence [coordination, TU] is unique. ... This conception of cognition and truth was a radical break with almost all systems of traditional philosophy, according to which cognition meant the finding of a truth that was hidden behind the appearances and could be discovered there by the power of reason, which the trained philosopher was supposed to possess. According to Schlick, however, cognition is the establishment of a correspondence [coordination, TU]; this means, primarily, building up a system of symbols with relations among them. Cognition becomes an activity, the construction of a system of symbols that has only to fulfil the requirement of uniqueness." (1949a, 29-30) This conception of truth Frank found also in Reichenbach, in Mach under his favoured interpretation, and in Wittgenstein's Tractarian claim that "to understand a proposition means to know what is the case if it is true" (ibid., 32). Note that Frank's choice of terminology—"correspondence" for the Schlick's "*Zuordnung*"—is very unfortunate, given his own opposition to the correspondence theory of truth. What he means to designate by that term is what since has been translated as "coordination" and "unique coordination" (see Schlick 1918/25 [1974], §10). (A better translation is indicated here by the inserted square brackets.)

[25] Frank presumably simplified matters for greater perspicuity. Carnap worked with definite structure descriptions throughout his system instead of also using, like Schlick, implicit definitions; moreover, his basic elements were not sense impressions but unanalysed experiences from which sense data were constructed by the process of quasi-analysis. On Frank's pragmatist reading of the *Aufbau* see also Mormann (forthcoming).

[26] "Was mich dabei besonders interessiert, ist folgendes. Die von den exakten Wissenschaften herkommenden, logistisch geeichten Denker, wie Sie z.B., kommen schliesslich zu denselben Konklusionen, wie die vom logischen Standpunkt etwas rohe Philosophie des Pragmatismus von W. James u.a." Carnap, quoting Frank, to Neurath, 7 October 1928, RC 029-16-01 ASP, pp. 1-2.

[27] See Creath (1982) for an argument that the verificationism adopted in the *Aufbau* was no stronger than that of *Scheinprobleme*.

[28] What in recent years has been learnt about the Neokantian roots of Carnap's *Aufbau* (see Friedman 1987, 1992, Richardson 1998, Mormann 2007) serves to render Carnap's reported astonishment understandable, though evidence of Carnap's early study of Vaihinger's philosophy of the "as-if" (1911) suggests that his astonishment should have been a qualified one; on Vaihinger's influence see Carus (2007). Incidentally, Vaihinger was one of the few German philosophers who expressed appreciation for American pragmatism; but this possible connection cannot be pursued further here either

).

[29] In other words, Frank's verificationist reading of the *Aufbau* discounts its Kantian origins and puts its reductionist architecture of cognition at the service of positivist epistemology. What's notable is that this positivist reading of the *Aufbau* did not adopt the strict or complete verificationism promoted by Wittgenstein who in late 1929 coined the slogan that "the sense of a proposition is its verification" (as reported in Waismann 1967 [1979, 47]). To be sure, in his autobiography Carnap claimed that such a strict verificationism and foundationalism was what the *Aufbau* provided (1963a, 57), but this claim would appear to reflect only the Viennese interpretation of the *Aufbau* that Carnap himself took on board around 1929-30 (before he was rescued for physicalism by Neurath). Consider, e.g., this comment of Carnap's about the methodologically solipsistic constitution system: "The positivist system corresponds to the epistemological viewpoint because it proves the validity of knowledge by reduction to the given." (1930 [1959, 130]) Neither the term "positivist system" nor the idea of "proving the validity of knowledge by reduction to the given" appear in the *Aufbau*. Elsewhere Carnap dated what in (1963, 56-59) he called the subsequent "liberalisation of empiricism" to "about 1931" (1936-37, 37n).

[30] For further confirmatory instances see §8 below.

31 Importantly, Carnap's non-strict verificationism preceded Schlick's adoption of Wittgenstein's strict verificationism (see fn. 27 above). We must also remember that the Circle's reception of Carnap's *Aufbau* did not start with its publication but with his visit in 1925. Note that in an immediate response Schlick, in his "Erleben, Erkennen, Metaphysik" (1926), made a first move in the direction that was completed only in Carnap (1928b). Schlick associated his longstanding antimetaphysical complaint (that, typically, metaphysicians confused logically structured cognitions with qualitative contents of experience by offering attempts to articulate the latter as the former) with a diagnosis of the metaphysicians' failure along Carnapian lines (the failure to specify how their concepts related to experience was construed along the lines of the reductive relation in then still-in-progress *Aufbau*). What Schlick did not yet provide, however, was a criterion of significance. His habilitation and still his *General Theory of Knowledge* used verification exclusively as a criterion of truth; see his (1910-11 [1979a, 74-75] and 1918-25 [1974, 162-165]).

32 Incidentally, Mach's dictum was quoted *verbatim* also in Jerusalem (1897 [1905, 175]) by way of contrast with Wundt's speculative metaphysics. (In Jerusalem's 1905 collection this paper precedes two on Mach,)

33 Compare Frank (1938 [1949, 188]) where the same idea is supported by reference to *Logical Syntax* and "Testability and Meaning" instead of to the *Aufbau* as here.

34 "The conceptions of Mach are to a large part programmatic in character. Neither he himself nor his immediate students have systematically carried further his point of view." (1929-30 [1949b, 100, translation restored]). "[T]he method of pragmatism … tried to characterize the system of science in a general and somewhat indefinite way by saying that the system is an instrument to be invenbted and constructed in order to find one's way among experiences…" (Ibid., 104-05).

35 This strongly suggests that had they been apprized of the dispute between James and Peirce (see fn. 7 above), they would have taken the side of Peirce's "logical" reading of his principle, as opposed to James's psychological one.

36 What Frank did not appreciate at the time was that Carnap did not just render rigorous Mach's criterion of scientific significance but also changed its nature. What with Mach was a criterion drawn from scientific practice and so remained limited to what was conceivable in a given experimental culture, was universalized by Carnap's formal-logical criterion of reducibility. This change brought with it different trajectories of success. While seemingly successful in the beginning, in the end, a Carnapian formal criterion was tenable only with regard to scientific theories axiomatised in formal languages (as in Carnap 1956), but not with regard to natural language formulations (see Hempel 1951). (Schlick's Wittgensteinian variant of verificationism has its own further problems.) The later Frank was thus forced to return to Mach's informal-practical criterion in his principled objection to metaphysics (see Uebel 2011).

37 Another difference concerns the metaethical conflict between various kinds of non-cognitivism and various kinds of naturalism; see Mormann (2007) and (2015).

38 For a comprehensive list of the lectures given in the Philosophical Society see Reininger (1938, 21-43), for a list of those given by Frank, Hahn and Neurath see Uebel (2000, 141–142).

39 The relevant paragraph reads: "With James's *Pragmatism* the German audience is introduced to a system that strongly emphasizes the connection between thought and action. The translator, Professor Wilhelm Jerusalem, serves in a way as a representative of this doctrine among the German philosophers. He bases his considerations to a still higher degree on biological theories than James. The basic idea of James's book is the following. Given two theories for the same subject matter, we need to determine whether their practical applications bring about different results. (It is unclear, however, what precisely James means by 'practice'.) If no difference results, then according to James it does not matter what theory we hold. For James theories are tools for mastering reality; those are 'true' that perform this service better. Based on lectures this book is very easy to read." (1909, 139, trans. TU)

40 There is an obvious parallel here with Peirce's view that "thought is essentially an action" (1878). Whether Neurath had read Peirce's "How to Make Our Ideas Clear"—if he did it is most likely to have been the French original—seems impossible to determine. Neurath makes no mention of Peirce or his paper, but neither does he mention any other author or work of pragmatism. To his audience in Vienna—some of whom reportedly were scandalised by Neurath's talk (see Uebel 2000, 283)—the immediate relevance of the previous debates about pragmatism would no doubt have been clear.

41 So characterised in Stein (1908), one of the first serious discussions of pragmatism in German alongside Jerusalem's.

42 Whether this explicatory choice was a happy one is questionable, of course, given Schlick's opposition to the pragmatist conception of truth. Note that Frank here spoke of the correlation of symbols and "experiences" instead of one of statements and facts as he did, more correctly, in his retrospective (1949a, 33). It would appear that Frank here gave a problematical positivistic reinterpretation of Schlick's original conception, perhaps encouraged by the verificationist reading of the *Aufbau*. For Schlick's own critical reply see §10 below.

43 In later works from the time of his American exile when he continued to urge the active convergence of logical empiricism and pragmatism Frank made frequent references to Peirce and James and related their pragmatist views of meaning and truth to the Circle's verificationist strategy. So, e.g., in (1949a, 32-33) and (1950, 32-33).

44 Michael Losonsky pointed out to me that since Frank lived and taught in Prague, it may not be insignificant that there was a lively interest in American pragmatism among Czech speaking philosophers in the post-World War I period, in particular on the part of Karel Vorovka (1879-1929), a mathematician and professor of philosophy at the Czech language Charles University who published *Amerika Filosofie* (American Philosophy), a survey which included chapters on James and Peirce in the last year of his life. Given that Vorovka "argued against positivistic scientism from an idealistic starting point" (Zumr 1998), he may seem to be an unlikely reference point for Frank, though the latter's appreciation of Bergson's preface to the French edition of James's *Pragmatism* shows that this type of opposition need not be decisive. With the well-known writer Karel Capek having published a monograph on the topic in 1918 pragmatism was more widely discussed in Czech circles and a contributory influence on Frank's rediscovery of pragmatism, while not established, cannot be ruled out.

45 For examples of Jerusalem's advocacy of pragmatism see his (1908a), (1910) and (1913).

46 On the absence of agreement amongst the participants in the debate as to the definition of psychologism, see Kusch (1995, Chs. 4-5). Jerusalem's position was unambiguous.

47 See Mach's endorsement of Jerusalem (1905) in his Preface to the second edition of his own (1905 [1976, xxxv]).

48 According to Jerusalem's own account, his psychologism played an important role in his introduction to pragmatism. It was precisely the anti-apriorist psychologism of Jerusalem's (1905) that prompted F.C.S. Schiller in a review of it to comment on his proximity to pragmatism which in turn led Jerusalem to inquire about this movement with James (with whom he had been in correspondence previously)—which ultimately led to Jerusalem becoming James's translator; see Jerusalem (1922, 60 [1925, 32–33]).

49 As already noted, Peirce and Dewey hardly figured in these German discussions of pragmatism On Dewey's struggle with idealist conceptions of logic see White (1943, Chs. 8-10). It is notable that still in later years Morris noted that "Dewey interprets even logical rules as empirical generalizations embodying methods of inquiry which have proved particularly successful for the purpose of inference and which have therefore have been transformed by the users into principles accepted for the time being as stipulations for the carrying-on of future inquiry" and subsequently suggested what amounted to a recalibration of pragmatism (1938, 67)—an amendation which, along with his accomodation of Carnapian semantics, was not welcomed at all by Dewey and his circle (see Reisch 2005, Ch. 13).

50 On their early study of Russell, see Uebel (2000, 70). It may be noted that this was not as yet the conception of logic as "concerned with the real world just as truly as zoology, though with its more abstract and general features" (Russell 1919, 169)—an early version of which as "the theory of objects in general" Neurath was familiar with in the form proposed by his mentor Gregorius Itelson (see Neurath and O. Hahn 1909 [1981, 5 fn.])—but that of logic as the science of propositions (Russell 1903, §§10, 12-13). On Itelson, see Freudenthal and Karachentsev (2011).

[51] See the challenge by Mally in response to Jerusalem (1909) in Elsenhans (1909, 814-815).

[52] Whether Jerusalem was apprized of Russell's or Itelson's universalist conceptions of logic is unclear: neither his (1905) with its focus on Hermann Cohen and Edmund Husserl, nor his Heidelberg lecture (1909) mention it.

[53] See Nagel (1935) and especially (1944) which virtually gave the name to an important collection of his essays: (1956) albeit with "Ontology" changed to "Metaphysics".

[54] For Wittgenstein, tautologies "lack sense" and "do not represent any possible situations" for they "admit *all* possible situations" (1922, Prop. 4.461, 4.462, orig. emphasis). Necessary truths were logical truths which held in every possible case and were true in virtue of their logical form alone (ibid., Prop. 6.113), irrespective of the content of their propositional arguments. Wittgenstein's conception of the tautologous nature of logic constituted a significant break with the logicist tradition. Against Frege and Russell's universalist conception (he does not seem to have known about Itelson) Wittgenstein held that "all theories that make a proposition of logic appear to have content are false." (Ibid., Prop. 6.111)

[55] That the Circle's pragmatism, as it were, did not face the old dilemma any longer is insinuated obliquely by Frank (1929/30 [1949a, 103-5]). It also fits into this picture that Hahn's lecture at the same Prague conference concentrated on spelling out the advantages and consequences of the conception of logic as tautological (see Hahn 1930).

[56] It must be noted that not all pragmatists shared the denial of realism: the later Peirce comes to mind here.

[57] The second part of the quotation given is taken from James himself (1907 [1991, 38]), the first is a translation of Hahn's introduction to it.

[58] They were not alone in doing so: consider the passage in Carnap's "Elimination of Metaphysics" running together truth conditions and verification criteria (1932 [1959, 62 and 64–65]). Schlick's attempt to derive a decisive criterion from his view of truth as unique coordination in (1934) also suggests that the distinction between characterizations and criteria of truth was no longer as sharp as it had been form him in 1910.

[59] The passage stems from a paper by Helen Bradford Thompson, "A Critical Study of Bosanquet's Theory of Judgment", in the Dewey volume (1909, 106). Hahn did not make this clear.

[60] On Neurath on truth see Uebel (1991, 631–633) and (2007, 231–233); compare also Mancosu (2008).

[61] The first sentence is in German in the original.

[62] To be sure, to use a distinction from Hookway (2008), the pragmatism of the former members of the first Vienna Circle centred on the pragmatic maxim and only selectively attended to the combination of ideas that nowadays tends to be called pragmatism: thus they accepted anti-sceptical fallibilism but did not abandon the fact-value distinction.

[63] The terms are Carnap's: see his (1963, 57).

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