On the Kantian Background of Neopositivism

Werner Sauer

I

According to what may be called the received view of Neopositivism's place in the history of philosophy, the title of this article must sound far-fetched at least. For according to that view Neopositivism, as it flourished in the Vienna Circle and elsewhere, is in a simple and straightforward way antithetical to Kantian philosophy because of its radical denial of the latter's basic thesis of a synthetic *Apriori*, and beyond this also in the wider sense of representing a philosophical tradition entirely heterogeneous from the Kantian one.

This view took shape already in the Vienna Circle's own days, when in its manifesto of 1929, *Wissenschaftliche Weltauffassung. Der Wiener Kreis*, Otto Neurath in an attempt to throw the light of *Ideengeschichte* on the Circle's genesis, traced its teachings back to sources such as the earlier empiricism and positivism from Hume to Mach, the methodology of science from Helmholtz to Einstein, and the development of mathematical logic by the work of, among others, Frege and Russell.[1] The method employed by the new empiricism and positivism of the scientific world-conception, the manifesto then explains its central tenets, is that "of logical analysis", applied with the aim of showing that what can be known *a priori* is only tautologies (analytic statements), and of effecting a "step-by-step reduction" of every empirical concept "to concepts . . . referring to the given itself"; the ultimate result of this reduction process would be the establishment of the *Einheitswissenschaft* in the form of "a constitutional system" of those concepts such that "the constitutional theory", i.e., the theory concerned with the nature of such a conceptual system, as set forth in Rudolf Carnap's *Der logische Aufbau der Welt* (1928), "provides the frame in which logical analysis is applied by the scientific world-conception".[2]

Thus in the manifesto the historical background of Neopositivism is drawn with no reference to the Kantian tradition at all — even though at least when Helmholtz is mentioned, being he after all one of the precursors of Neokantianism, such a reference would only be a matter of course. Kantianism comes into the picture only as an opponent whose basis has been definitely uprooted by the method of the scientific world-conception; and moreover, the negation of that basis figures in the account given as the very cornerstone of the new movement:

> . . . through logical analysis metaphysics not only in the . . . classical sense of the word is overcome, . . . but also the covert metaphysics of Kantian and modern apriorism. The scientific world-conception does not know . . . of any "synthetic judgments *a priori*" as presupposed by Kant's theory of knowledge. . . . It is precisely the rejection of the possibility of synthetic knowledge *a priori* which constitutes the fundamental thesis of modern empiricism.[3]

Weighty protest against this way of viewing the relationship between the two philosophical movements has come from Lewis White Beck, the eminent Kant scholar and historian of philosophy. "The resemblances", he maintains in disagreement with the received view,

> between Kant's program and the program of the school of logical positivism are unmistakable. A history of logical positivism should bring its Kantian provenance to light. The mediating role of the Marburg school of neo-Kantians should be given special attention. . . . While the differences are as obvious as the similarities, they have been so magnified . . . that the resemblances have been ignored and possible historical influences little suspected.[4]

In the following, material will be assembled which supports the thesis Beck has put forward, and in doing so we shall concentrate in systematic respects chiefly on Carnap's before-mentioned book: a restriction surely not wholly arbitrary and unjustified in the face of the central role within the scientific world-conception attributed to the *Aufbau's* constitutional theory in the Vienna Circle's manifesto. Before going into the *Aufbau*, however, some remarks on the two features of the received view as such will be in order.

Topoi **8**: 111–119, 1989.

II

To turn first to the question of the synthetic *Apriori*, we are even in this seemingly so obvious and straightforward case of disagreement well advised to be cautious in order not to fall prey to mere *idola fori*, handy slogans which conceal rather than reveal what the issue really amounts to. Of course, Kant asserts and the Neopositivists deny that there are epistemologically sound statements that are both synthetic and *a priori*. But in fact the matter is not as clear-cut as that; to see this it will suffice to consider briefly Kant's thesis that arithmetic is synthetic.

Kant's claim that "7 + 5 = 12" is not analytic but synthetic is the claim that such a formula is not true solely in virtue of the principle of contradiction, or, put differently, that it does not, explicitly or implicitly, possess the form "*AB* is *B*".[5] The polemical side of this doctrine was directed against the Leibnizian account of arithmetical truth. Leibniz not only asserted, as Hume did, what Kant then denied but actually attempted to demonstrate, using "2 + 2 = 4" as his example, the reducibility of arithmetical equations to overt identities by means of definitional substitutions only.[6]

Frege, in renewing the quest for a demonstration of the analyticity of arithmetic, agrees with Kant to the point that the literal Leibnizian view is untenable.[7] So he replaced the account of analyticity upon which the issue between Kant and Leibniz was based by a somewhat broader one which expands Kant's truth in virtue of the principle of contradiction into truth in virtue of the general laws of logic (*plus* definitions, of course).[8] However, since Kant characterizes logical truth just as analyticity in terms of the principle of contradiction,[9] we may safely reconstruct his notion of analyticity such that it nominally fits Frege's. Of course, Frege's logic is far more powerful than the logic Kant knew. But again, nor does this fact as such yet create any profound difference in the matter; in the final analysis, the difference that really counts lies rather in a basic epistemological assumption to which, furthermore, the analytic/synthetic distinction is differently related to.

From Kant's account of the distinction it immediately follows that in case a statement is synthetic its truth depends on there being given some object as the extra-conceptual "third thing" in which the statement's concepts are interconnected. Now the basic epistemological assumption alluded to above is, in Kant's case, that objects are given to us never by thought unrelated to sensibility, or pure reason, but only through sensibility-based intuition, and hence to make an epistemologically sound synthetic statement involves referring, in some way or other, to intuition, be it empirical or pure.[10] Thus the core of Kant's doctrine that arithmetic is synthetic amounts to the two theses that its truths are about *objects* and that, secondly, those objects are supplied by (of course, pure) intuition.

It is the second thesis which Frege attacks. He rejects Kant's epistemological assumption and claims that objects can be given to us by pure reason as well.[11] But from this he does not draw the conclusion that pure reason yields synthetic as well as analytic statements: strictly holding fast to the connection of syntheticity with intuition[12] he takes the opposite line and infers that there are analytic statements involving reference to objects. And he believed to have shown that there are in fact such *logical objects*, out of which then the numbers could be constructed, by way of the principle embodied in axiom (v) of his *Grundgesetze der Arithmetik*, stating, roughly, that iff the same objects fall under both concepts *F* and *G* the value-ranges of *F* and *G* are identical. However, Frege himself was not all too sure as to the logicality of this principle which links a statement about *concepts* to one about *objects*, items he strictly distinguishes from concepts; commenting on the basis of his edifice he writes, "As far as I can see, dispute can arise only about my principle of value-ranges (v) . . . I hold it to be purely logical. In any case, by it the place is marked where the decision must fall".[13]

And it fell. What is here of interest are the conclusions Frege eventually drew from Russell's antinomy which overthrew his axiom (v). The antinomy, he came to be convinced, has shown that by "the logical source of knowledge . . . alone no objects can be given", and hence, that one has "to give up the opinion that arithmetic is a branch of logic".[14] At first sight Frege's total rejection of logicism may appear as an extreme overreaction to the antinomy, but in truth it was just consistent. Frege holds, as Kant did, that universality and abstraction from any particular domain of objects are essential marks of a logical law;[15] but after the antinomy he could have sustained his programme only by imposing certain restrictions upon axiom (v) which, when so modified, he could not have acknowledged as a *logical* principle anymore.

Now Russell, carrying on the logicist programme and, unlike Frege, applying it also to geometry, claimed in 1903 to have demonstrated "that all mathematics

follows from . . . logic";[16] however, what he thought to have shown thereby is emphatically not what one would expect. Clarifying his position he says,

> Kant never doubted for a moment that the propositions of logic are analytic, whereas he rightly perceived that those of mathematics are synthetic. It has since appeared that logic is just as synthetic as all other kinds of truth.[17]

And this very peculiar brand of logicism Russell espouses still in 1912: two years after the publication of volume I of his and Whitehead's *Principia Mathematica* he still says that Kant "deserves credit . . . for having perceived that . . . all pure mathematics, though *a priori*, is synthetic",[18] and hence, by implication, that logic is synthetic as well.

The objectionable element of Kant's philosophy of mathematics Russell sees, like Frege in the case of arithmetic, in the connection of mathematics with intuition.[19] But as is already apparent, in the period under consideration Russell does not move on from its rejection to the analyticity thesis, and *insofar* he remains a Kantian. Still, on the deeper level concerning the sources of logico-mathematical knowledge his divergence from Kant is as crucial as is Frege's. The central issue between Frege and Kant was about the question whether by pure reason we can attain to truths about objects, and such truths of reason in the tradition of rationalism is what Russell's logicism is about just as much as Frege's. In Russell's case those objects are universals, i.e., *n*-adic properties, conceived of platonistically; in his own words, "[a]ll *a priori* knowledge" — hence all mathematical knowledge — "deals exclusively with the relations of universals".[20]

So, when the Neopositivists saw in the rise of logicism just a successful assault on the very stronghold of the synthetic *Apriori* in the service of empiricism,[21] a considerable amount of historical repression was involved. The common denominator of the logicism both of Frege and of Russell up to *Principia* was a *rationalistic* conception of logicism opposed not only to *Kantian* Apriorism but even more so to empiricism. To be sure, both of them came to abandon rationalism. But for Frege this was tantamount to abandoning logicism altogether. Russell, under the influence of Wittgenstein, indeed soon came to hold that logic, and hence mathematics, consists only of empty tautologies;[22] yet he remained skeptical as to the possibility of a satisfactory explication of the notion, similar in intention to Kant's analyticity, of tautologousness, still in 1937 candidly admitting to be "unable to give any clear account" thereof.[23] But without such an account, which, moreover, has not become a more promising project since then either,[24] the theses of the Neopositivists as to what logicism has proved against Kant are necessarily obscure and lacking in sound foundations; moreover, later on we shall have occasion to note *in concreto* convergences with certain Kantian views on the role of formal elements in the fabric of human knowledge hardly reconcilable with the ideas of mere repetitiveness and emptiness associated with the notions of analyticity and tautologousness.

III

Turning now to the other, more general feature of the received view, we find that Neurath's reconstruction, in the Vienna Circle's manifesto, of Neopositivism's historical background did not even represent the *communis opinio* within the movement itself. For when from the Austrian Neurath who in socio-cultural perspective tied the movement's rise to the intellectual climate prevailing in Austria, conspicuous for its lack of any stronger Kantian tradition,[25] we turn to German members of the movement who did not share Neurath's background nor his obsession to purge the movement from any connection to the "German tradition", an entirely different picture emerges.

A striking piece of evidence for this we find in the journal *Erkenntnis*, the joint organ of the Vienna Circle and the Berlin Society of Scientific Philosophy, edited by Carnap and Hans Reichenbach. In volume three of the journal there appeared the correspondence between Friedrich Albert Lange, one of the founders of Neokantianism, and the zoologist Anton Dohrn. In their introduction to the correspondence the journal's editors, i.e., Carnap and Reichenbach, declare as the aim of its publication the furthering of the scientific way of thinking in philosophy, thereby celebrating Lange's *Geschichte des Materialismus* (1866) as an attempt to

> transform scientific thinking into philosophical criticism and, at the same time, to test philosophical thinking at scientific material . . .; and indeed the historical merit of Lange, and of the Marburg school founded by him, was exactly to have rediscovered the scientist Kant and to have prevailed with him over the metaphysical interpretations of Kantianism.[26]

And concerning the correspondence they write:

> Let us here have speak for us a scientist and a philosopher; certainly, the contents of their problems are no longer ours, their Kantianism is as far behind us as the physics of the ether and of classical mechanics, but their attitude and their striving, their earnestness and their affirmation of the scientific way of thinking are still a model for us today.

Kantianism as a forerunner, in spirit still exemplary, of the new scientific philosophy: the change in outlook as against that of the Vienna Circle's manifesto is striking indeed. In this view, Kantianism, at least as exemplified by Lange and by the Marburg school of Neokantians, and Neopositivism belong to *one* tradition in philosophy, united by the spirit of scientific philosophizing, but separated by the developments in science from classical to modern physics;[27] and this view of the relationship between the two philosophical movements must have occurred quite naturally to a Carnap and a Reichenbach, reflecting, as it does, their own development, as both of them began their career as philosophers of science within the framework of Neokantianism.

Reichenbach's early Kantianism shall not concern us here,[28] but only Carnap's. In his doctoral thesis on space of 1921, Carnap espoused a Kantian position at least insofar as he regarded the topological properties of perceptual space as synthetic *a priori* in Kant's sense.[29] Taking into account further works of Carnap in that period, we get, in a very brief outline, the following general picture of his early philosophical position. Regarding "the sources of physical knowledge", Carnap contends, "pure empiricism has lost its dominance", since it has increasingly become evident that in "the construction of physics ... non-empirical principles must be employed".[30] In his eyes, the main deficiency of Kant's synthetic *Apriori*, understood as a set of *incorrigible* non-empirical principles of experience, is its being far too rich in content: only the "form factors" of immediate sense-experience, namely "a certain spatial and temporal order, and further, certain qualitative relations of sameness and difference", are synthetic *a priori* in this sense,[31] whereas the non-empirical form factors governing the transition from the "primary world" of immediate sense-experience to the "secondary world" both of common sense and of science are conventional stipulations.[32]

However, conventionalism regards the secondary world is not really a break with Kantian Apriorism as such. Carnap criticizes Neokantianism — clearly with the Marburg school of Hermann Cohen and his followers in mind — mainly on two points: to have overlooked the difference between the primary and the secondary world, and to hold the latter to be uniquely determined by incorrigible form factors which according to him are true only of the primary world. By these criticisms, however, Neokantianism's "true achievement, namely, the demonstration of the object-producing function of thought", Carnap emphasizes, "remains untouched and underlies also our own conception of the secondary world".[33] So one might call his own non-empirical principles of the secondary world as well a relativized synthetic *Apriori*, and he himself refrains from doing so only because he wants to reserve the expression "synthetic *a priori*" for incorrigible principles.[34] And it may be added that with his conception of the secondary world Carnap is even closer to the Neokantians than he himself admits if we take into account the fact, neglected by him, that they themselves were well on the way to liberalize their synthetic *Apriori* in accordance with the evolution of science and to take it in a more relativistic spirit.[35]

Carnap's principal deviation from (Marburg) Neokantianism, then, lies in the notion of the primary world, which notion combines the positivistic idea of the given with the original Kantian idea of synthetic *a priori* forms of intuition.[36] In this combination the Kantian component is dominant, however: the defining mark of the primary world is not experiential immediacy but "necessity of [its] forms",[37] and correspondingly, the givenness of the primary world does not refer to any pure content of experience, this being "a mere abstraction of thought",[38] but to the content already *formed* by those necessary (i.e., synthetic *a priori*) form factors which determine the realm of the primary world.

As Carnap himself says, from 1922 on he was already working on the *Aufbau*, of which a first version was finished in 1925; his Kantian doctrine of synthetic *a priori* forms of experience, however, he abandoned only after he had come to Vienna in 1926.[39] Presupposing the received view, and its characterization, from the Vienna Circle's manifesto up to the present, of the *Aufbau* enterprise as a grand attempt to substantiate "the old empiristic—positivistic programme ... of reducing all scientific concepts to ... what is immediately given in sense-perception",[40] the chronology is bound to cause puzzlement. But perhaps we get a more consistent picture if we look at the *Aufbau* the other way round. To be sure, its published version has

officially renounced the synthetic *Apriori*, tersely stating that "in the view of the constitutional theory 'synthetic judgments *a priori*' do not exist at all",[41] and thus accommodating its teaching to what the Vienna Circle's manifesto calls the basic thesis of the new empiristic-positivistic philosophy. In the face of the chronological facts cited, however, it is difficult not to suspect forthwith that this amounts to no more than a mere surface adaption, obscuring but not erasing the *Aufbau's* Kantian heritage; and taking a closer look at certain aspects of the *Aufbau* edifice, we shall indeed find ample evidence for a strong continuance of specifically Kantian patterns in Carnap's thought.[42]

IV

Carnap's aim in the *Aufbau* is to expound his constitutional theory and to sketch the outlines of a constitutional system of all empirical concepts on a solipsistic basis. To constitute a concept F on the basis of the concepts G and H is to state a rule, a "constitutional definition", which allows the transformation of any open sentence containing F into such ones that contain G and H only, and the constitutional basis, the system's "ground elements", is to be taken from the domain of one's own experiences because the *Aufbau* system should satisfy the criterion of epistemic primacy of its basis. Carnap's ground elements, however, are not the traditional sense data, sensations, etc. of empiricism, but what he calls elementary experiences, that is, places in "the stream of experience" in their "totality and undivided unity" which allow only of statements to the effect "that one such place stands to another one in a certain relation".[43] Therefore, besides its ground elements the constitutional basis must also comprise at least one relation; in the *Aufbau* system it is exactly one, the recognition-of-similarity (*Er*) obtaining between elementary experiences.

With this basis, the class *erl* of the elementary experiences and *Er*, Carnap believes to have combined the insights of two different philosophical creeds:

> The merit for having uncovered the necessary basis of the constitutional system . . . belongs to two quite different, often mutually hostile philosophical schools. Positivism has emphasized that the only material of knowledge consists in the raw given of experience; there the ground elements of the constitutional system are to be found. Transcendental idealism, especially of Neokantian line, . . . has, however, rightly pointed out that these elements don't suffice; in addition, orderings must be posited, our "ground relations".[44]

Although from this passage it may appear so, the "positivistic" and the "Kantian" component of Carnap's constitutional basis are not on an equal footing: just as before the content of the primary world was subordinated to its form, so now the material component of the constitutional basis is actually secondary to the formal ordering imposed upon it by the ground relation since subsequently *erl* will be defined (constituted) as the range of *Er*.

In discussing the requirement of introducing at least one ground relation Carnap refers, *inter alia*, to Ernst Cassirer's *Substanzbegriff und Funktionsbegriff* of 1910. In the part of the book he refers to in particular,[45] Cassirer deals with the problem of how science which is essentially abstract can deal adequately with the reality of experience which is essentially concrete. According to Cassirer the entire problem arises, however, only under the misguided presupposition of interpreting the generality of science in terms of the generality of the *genus* concept in traditional logic. The peculiar feature of the concepts of science, Cassirer has already pointed out before, lies in their role "to arrange the 'given' into sequences and to allocate it its fixed position within those sequences".[46] From this point of view there arises no logical gap between the general and the particular, since it is the very task performed by the general concept "to make possible, and to exhibit, the connection and the order of the particular itself". Therefore, the process of ordering the particular along these lines does not destroy its particularity, but leads only to its "dematerialization", as Carnap will say, since it replaces the determination of the particular through a complex of perceptual attributes by its determination through a complex of non-perceptual relations; and in this process of "idealization", the completed determination of the particular through a relation complex functions as a regulative idea which fixes "as infinitely distant point the direction of cognition" and provides us with "the true and full expression of objectivity".[47]

Cassirer's specific version of the common Marburg doctrine that "[t]he entire and indivisible content of thought must itself be a product of thought", as Cohen had put it,[48] finds its close parallel in the *Aufbau's* insistence on the primacy of form over content. In introducing a relation as his system's primitive concept Carnap pursues the aim of closing the gap between the

subjectivity of individual experience and the objectivity of scientific reality: if all content of knowledge belongs to the different subjective streams of experience, then the objectivity of knowledge cannot derive from its content but must be somehow grounded in its form. To this end Carnap points out that although "the material of the individual streams of experience ... is altogether incomparable, ... certain structural properties are the same for all streams of experience",[49] the basic common structure of all streams of experience being given, of course, by the asymmetry of *Er*. Now, the "structural description ... constitutes the highest stage of formalization and dematerialization",[50] and therefore, by its complete detachment from any content of experience, also the highest stage of objectification. Hence, any truly scientific statement must be transformable into a structural statement, for "science wants to speak of what is objective", whereas "everything which does not belong to the structure ... is, in the final analysis, subjective".[51] Thus, at its completion the *Aufbau* system would be a structural description — not to be identified with a full structural determination which of course for Carnap, too, remains an "incompletable task"[52] — of empirical reality in its known entirety, and this by the construction of classes and relations with *Er* as the only non-logical basis of the edifice.

Clearly, there is a close affinity between Carnap's idea of objectification through structuralization and certain essential features of Cassirer's "logical idealism". Of course, Neokantian "logism" is not set on formal but on a transcendental logic as the logic that objectifies experience, whereas Carnap knows of formal logic only. But in fact this difference is not as serious as it looks. In Cassirer's view, the calculus of classes and relations of modern formal logic, Carnap's tool of constitution, *is* a transcendental logic. Pointing out his fundamental agreement with the Russell of 1903 in this respect,[53] he defends its syntheticity; the critical question then is, just as in the case of Kant's categories, on which domain of objects its validity is to be grounded. And the answer to this question is, again in line with Kant but contrary to Russell's platonism, that the forms of synthesis, such as class and relation, provided by modern logic find "their justified application only within empirical science itself", in that only by applying them to the experiential manifold it "becomes possible to speak of a stable and law-like order among appearances and thus of their objective significance".[54]

Although Carnap holds that "logic (including mathematics) consists only ... of tautologies",[55] so that Cassirer's problem of justification would seem not to arise anymore, his approach leads nevertheless in the very same direction. Constitution is an objectifying process carried out by the "*synthetic* means ... of class and relation".[56] Here the problem has come to the fore alluded to at the end of section II, namely, of how a logic which is tautological can yield tools for an *objectifying synthesis*. The function of formal logic, or more precisely, of its calculus of classes and relations, in the *Aufbau* is exactly that of a transcendental logic in Kant's or Cassirer's sense since it provides an answer to the Kantian question of how objective experience is possible. This question, and its answer, Carnap shares with Cassirer; it is only that in Cassirer the answer to this question is at the same time an answer to the further question of justifying that logic by providing it with objectual content which it, not being analytic in Cassirer's view, is in need of.

Compared with Carnap's earlier position, the most conspicuous change that has taken place is the dissolution of the dualism between the primary and the secondary world. This amounts to an important transformation of the primary world, in which the positivistic idea of the given was anchored, into a Kantian direction, to which we now shall turn.

V

Carnap substantiates the introduction of the elementary experiences as the ground elements by a criticism of the traditional notion of a sense datum, as exemplified by Ernst Mach's notion of a sensation. Such concrete *qualia*, Carnap argues, are "not the given itself but abstractions from it, hence something which is epistemically secondary",[57] thereby citing supporting evidence both from philosophical literature and from *Gestalt* psychology. The impact of the latter on his thought is not very specific, however, for he takes from it only the general thesis of the primacy of the whole over the part in the apprehension of a complex which he radicalizes to his conception of an elementary experience; philosophically, the notion of such undifferentiated totalities yet founding all experiential differentiations goes back, in the last analysis, to Kant's claim that every representation both is an "absolute unity" and contains "a manifold within itself".[58]

Entities of such a kind cannot be objects of imme-

diate cognition; they are "never present in consciousness as a bare, unprocessed material, but in . . . combinations and configurations all along".[59] The primary forming of the elementary experiences is that of *Er*, the proper primitive of the *Aufbau* system. Now it is clear that the items whose structural property of asymmetry *Er* represents are not a given in the usual sense of an object of cognition but cognitive acts, and moreover, rather complex ones if we look at Carnap's explication — not in the proper constitutional language of pure structural descriptions in which there can be no explication of the primitive *Er* but externally, in the "realistic language" — of "*x* stands in *Er* to *y*": "*x* and *y* are elementary experiences which by comparing a memory image of *x* with *y* are recognized as part similar".[60] Thus an instance of recognition-of-similarity contains the following four components: (1) an elementary experience *y*; (2) the retention of an elementary experience *x* by means of a memory image; (3) a comparison of *x*, by way of its memory image, with *y*; and finally, (4) the recognition of the fact that *x* and *y* are partly similar. Now in order to arrive at (4), it is not sufficient that (1) to (3) occur; there must also obtain a certain connectedness among the four components which accounts for their being different components of one and the same act of recognition-of-similarity: required is also the unity of consciousness in them, something akin to what Kant calls the "synthetic unity of apperception".[61] In this way, the basis from which Carnap proceeds in the *Aufbau* is consciousness itself in its "cognitional synthesis", or "apperceptive processing ... of the given",[62] as he himself puts it in conspicuously Kantian language.

So the relationship of the *Aufbau's* constitutional basis to Carnap's earlier primary world is as follows. Of the latter's forms we still have (part)-similarity and temporal order as the primary forms of the material of recognition-of-similarity: on the level of the realistic mode of expression, they are, like *erl*, already included (temporal order by implication) in the explication of *Er*, and on the level of constitutional language proper, they are, again like *erl*, definable immediately in terms of *Er*.[63] But they have ceased to be primary *simpliciter*, the real starting-point not being the primary world (now: *erl plus* part-similarity and temporal order) as such anymore but its cognitional apprehension; and herein lies the crucial change that has taken place as against Carnap's earlier position.

By now it is clear why Carnap's own characterization, cited in the previous section, of the constitutional basis of the *Aufbau* system as a combination of a positivistic and a Kantian component is not quite accurate. According to that characterization the positivistic component of the constitutional basis is to be seen in the elementary experiences understood as a "raw given of experience". But in this sense of the word there was no given even in Carnap's former position in which the notion of givenness referred to the complete, composite primary world, the given in the sense of a raw material of experience figuring as an abstraction only. Within the *Aufbau* scheme, however, there is no room anymore even for a given as espoused by Carnap before; to use his earlier language, the primary world has also become "produced in thought", thus in its *modus essendi* merging in the secondary world.

The dissolution of the supposed positivistic component of the constitutional basis Carnap himself states clearly and forcefully when summarizing the affinities between the constitutional theory and Neokantian idealism:

> Constitutional theory and transcendental idealism hold the view in common that all objects of knowledge are constituted (in idealistic language: "produced in thought"); indeed, only as logical forms constructed in a certain way the constituted objects are objects of knowledge. This holds ultimately also of the ground elements of the constitutional system. For they are indeed first presupposed as unanalyzable units, but then in the process of constitution various properties are ascribed to them . . . ; and only by this, that is, also only as constituted objects they become objects of knowledge in the proper sense.[64]

In this passage, the distinction between being given and being constituted which carried the former distinction between primary and secondary world is definitely rejected in favour of its second term; and the notion of the given espoused in it is in full accord with the Neokantian thesis that the given which underlies experience is only a bare *X posited* as the basis of the process of cognition which then becomes increasingly determined in the course of that very process:[65] the Neokantian strands in the *Aufbau*, located principally in the "objectification through structuralization" thesis and in the approach from cognizing consciousness, have come to the fore in all their pervasiveness.[66]

VI

Perhaps it appears to have been not a wholly idle undertaking to look at Neopositivism, in some of its

facets at least, from the unusual perspective of the Kantian tradition: neglected historical connections may become visible, and we may find once more that the actual way of proceeding in the realm of philosophical thought is much more complex and much less stream lined than the handy classifications we usually work with in dealing with philosophy's history would let us suspect.

To concentrate in an attempt like the present on Carnap's *Aufbau* needs no particular justification, as, while holding a prominent place within Neopositivism at a certain stage of its development, it also presents particular puzzles, systematically as well as in its genesis, for the received view. A revisionary look at the *Aufbau*, as here has been attempted,[67] may throw light on certain features of the doctrine set forth in it, as it is apt to render intelligible the fact that the book took shape at a time when Carnap still had quite pronounced Kantian convictions; and finally, it works also in the other time-direction. Perhaps in this way we might find it easier to understand that a philosopher like Nelson Goodman, who has systematically pursued and developed the *Aufbau* programme, has, without any dramatic break in his outlook, recently arrived at a position which is openly and admittedly Kantian in some manner:[68] in the presented view of Carnap's work, it is just that things have turned full circle.

Notes

Research for this article was assisted by the *Fonds zur Förderung der wissenschaftlichen Forschung*, Vienna.

[1] "Wissenschaftliche Weltauffassung. Der Wiener Kreis", Otto Neurath, *Gesammelte philosophische und methodologische Schriften* (Vienna 1981), vol. 1, 303. The manifesto does not name an author. Its preface is signed by Rudolf Carnap, Hans Hahn and Neurath; its actual authors are Neurath, who wrote a first draft of it, Carnap and Herbert Feigl: for this see Rudolf Haller, *Fragen zu Wittgenstein und Aufsätze zur Österreichischen Philosophie* (Amsterdam 1986), 193 (n. 8). The account of Neopositivism's historical background in the manifesto can safely be regarded as being in all essentials due to Neurath; it reappears, in a somewhat more detailed version, in his article cited in n. 25 below.

[2] "Wissenschaftliche Weltauffassung" (n. 1 above), 307—8.

[3] *Ibid.*, 307.

[4] Lewis White Beck, *Early German Philosophy. Kant and His Predecessors* (Cambridge/Mass. 1969), 483.

[5] For Kant's account of the analytic/synthetic distinction see, e.g., *Kritik der reinen Vernunft*, B 190—94, and *Logik*, Academy Edition of Kant's *Gesammelte Schriften* (Berlin 1902ff.), vol. 9, 111.

[6] Leibniz, *Nouveaux Essais sur l'Entendement Humain*, IV. VII. 10. For Hume see *An Inquiry Concerning Human Understanding*, Sect. IV, Part I.

[7] See Gottlob Frege, *Die Grundlagen der Arithmetik* (Breslau 1884), 7.

[8] *Ibid.*, 4.

[9] In *Logik* (n. 5 above), 52—53, Kant states three principles of logical truth, the other two being the principles of sufficient reason and of the excluded middle. Elsewhere, however, he indicates that he regards these two themselves to be application instances of the principle of contradiction, i.e., to be analytic. See *Preisschrift über die Fortschritte der Metaphysik*, Academy Edition, vol. 20, 277—78.

[10] For this see *Kritik der reinen Vernunft*, B 194—95, 746—50.

[11] See *Die Grundlagen der Arithmetik* (n. 7 above), 101, 115.

[12] *Ibid.*, 103.

[13] Frege, *Grundgesetze der Arithmetik*, vol. 1 (Jena 1893), vii.

[14] Frege, *Nachgelassene Schriften* (2nd ed. Hamburg 1983), 298—99.

[15] See, e.g., *ibid.*, 139. For Kant see, e.g., his concise account in *Logik* (n. 5 above), 12—13. On the affinity of Frege's conception of logic in this respect to Kant's, and on the consequences of Russell's antinomy given this conception, see also Hans D. Sluga, *Gottlob Frege* (London, Boston, Henley 1980), 108—10.

[16] Bertrand Russell, *The Principles of Mathematics* (7th impression London 1956), 9.

[17] *Ibid.*, 457.

[18] Russell, *The Problems of Philosophy* (new ed. London, New York, Toronto 1967), 46—47.

[19] See *The Principles of Mathematics* (n. 16 above), 4, 456.

[20] *The Problems of Philosophy* (n. 18 above), 59. On Russell's early view that mathematics is synthetic *a priori*, and on its relationship to Kant's philosophy of mathematics see also Ronald Jager, *The Development of Bertrand Russell's Philosophy* (London, New York 1972), 218—23; Alberto Coffa, "Russell and Kant", *Synthese* 46 (1981); G. G. Taylor, "The Analytic and Synthetic in Russell's Philosophy of Mathematics", *Philosophical Studies* 39 (1981).

[21] For a good example of this attitude see Rudolf Carnap, "Die alte und die neue Logik", *Erkenntnis* 1 (1930—31).

[22] See Russell, *Introduction to Mathematical Philosophy* (London 1919), ch. 18.

[23] *The Principles of Mathematics* (n. 16 above), Introduction to the 2nd ed., xii.

[24] For a concise exposition of the difficulties faced by logicism in this respect, see Stephan Körner, *The Philosophy of Mathematics* (London 1960), 55—58.

[25] A fact which in the eyes of Neurath made the Austrian intellectual climate a particularly fertile soil for the germination of Neopositivism. See his "Die Entwicklung des Wiener Kreises und die Zukunft des Logischen Empirismus" (1936), *Gesammelte ... Schriften* (n. 1 above), vol. 2, 676—79. On the early Kantianism in Austria and on the reasons why it could not consolidate to a stable tradition, see my *Österreichische Philosophie zwischen Aufklärung und Restauration* (Würzburg, Amsterdam 1982).

[26] "Dokumente über Naturwissenschaft und Philosophie. Briefwechsel zwischen Friedrich Albert Lange und Anton Dohrn", *Erkenntnis* 3 (1932—33), 262—63. Next quotation *ibid.*, 265.

[27] A similar view is expressed by Lothar Schäfer, *Karl R. Popper*, Munich 1988, 47—48.

[28] For Reichenbach's early Kantianism see his *Relativitätstheorie und Erkenntnis Apriori* (Berlin 1920), 46—47; see also Andreas Kamlah's notes in Hans Reichenbach, *Gesammelte Werke*

(Braunschweig 1977ff.), vol. 1, 473—74, 476—80, vol. 3, 475—76, and his "The Neo-Kantian Origin of Hans Reichenbach's Principle of Induction", Nicholas Rescher (ed.), *The Heritage of Logical Positivism* (Lanham, London 1985).

[29] Carnap, *Der Raum. Ein Beitrag zur Wissenschaftslehre* (Berlin 1922), 63—67.

[30] Carnap, "Über die Aufgabe der Physik und die Anwendung des Grundsatzes der Einfachstheit", *Kant-Studien* 28 (1923), 90.

[31] Carnap, "Dreidimensionalität des Raumes und Kausalität. Eine Untersuchung über den Zusammenhang zweier logischer Fiktionen", *Annalen der Philosophie und philosophischen Kritik* 4 (1924—25), 106. Although Carnap does not say so expressly, it is, both by his reference on the same page to Kant's "necessary form factors" of experience and by comparison with *Der Raum*, unambiguously clear that he considers the form factors in question as synthetic *a priori*.

[32] *Ibid.*, 106—7. On Carnap's early conventionalism see Hiram Caton, "Carnap's First Philosophy", *Review of Metaphysics* 28 (1974—75), and Edmund Runggaldier, *Carnap's Early Conventionalism* (Amsterdam 1984).

[33] "Dreidimensionalität des Raumes" (n. 31 above), 108.

[34] "Über die Aufgabe der Physik" (n. 30 above), 97.

[35] See, e.g., Hermann Cohen, *Logik der reinen Erkenntnis* (Berlin 1902), 499—500, and Paul Natorp, "Kant und die Marburger Schule", *Kant-Studien* 17 (1912), 209.

[36] Of Carnap's necessary forms of the primary world the third (qualitative relations of sameness and difference) does not, of course, correspond to a Kantian form of intuition, but rather to what Kant, *Kritik der reinen Vernunft*, A 114, calls the "transcendental affinity".

[37] "Dreidimensionalität des Raumes" (n. 31 above), 109.

[38] *Der Raum* (n. 29 above), 39.

[39] Carnap, "Intellectual Autobiography", Paul Arthur Schilpp (ed.), *The Philosophy of Rudolf Carnap* (La Salle/Ill. 1963), 16, 19, 50.

[40] Lothar Krauth, *Die Philosophie Carnaps* (Vienna, New York 1970), 12.

[41] Carnap, *Der logische Aufbau der Welt* (4th ed. Hamburg 1974), § 106.

[42] In the next two sections, I follow closely my "Carnaps 'Aufbau' in kantianischer Sicht", *Grazer Philosophische Studien* 23 (1985), sec. II and III.

[43] *Aufbau*, § 67.

[44] *Ibid.*, § 75.

[45] Ernst Cassirer, *Substanzbegriff und Funktionsbegriff* (2nd ed. Berlin 1923), 292ff. (For Carnap's reference see n. 44 above).

[46] *Ibid.*, 196. Next quotation *ibid.*, 298.

[47] *Ibid.*, 309, 362—63.

[48] *Logik der reinen Erkenntnis* (n. 35 above), 49.

[49] *Aufbau*, § 66.

[50] *Ibid.*, § 12.

[51] *Ibid.*, § 16.

[52] *Ibid.*, § 179.

[53] See Cassirer, "Kant und die moderne Mathematik", *Kant-Studien* 12 (1907), 35—37.

[54] *Ibid.*, 43, 45.

[55] *Aufbau*, § 107.

[56] *Ibid.*, § 69 (emphasis added).

[57] *Ibid.*, § 67.

[58] *Kritik der reinen Vernunft*, A 99. Although Carnap in his references in *Aufbau*, § 67, does not mention this passage directly, he refers to Robert Reininger, *Philosophie des Erkennens* (Leipzig 1911), 370—71, where it is quoted.

[59] *Aufbau*, § 100.

[60] *Ibid.*, § 78.

[61] *Kritik der reinen Vernunft*, B 135.

[62] *Aufbau*, § 100.

[63] *Ibid.*, §§ 109—10, 120. Spatial order has ceased to be such a form because of the nature of the elementary experiences as total presents.

[64] *Ibid.*, § 177.

[65] See, e.g., Natorp, "Kant und die Marburger Schule" (n. 35 above), 207—8.

[66] The idealistic commitments in the *Aufbau* are also pointed out, albeit from quite a different point of view, by Coffa, "Idealism and the Aufbau", Rescher (ed.), *The Heritage of Logical Positivism* (n. 28 above).

[67] Another deviant line in the *Aufbau* is pursued in my "Carnaps Konstitutionstheorie und das Programm der Einheitswissenschaft des Wiener Kreises", *Conceptus* 53/54 (1987).

[68] See Nelson Goodman, *Ways of Worldmaking* (Hassocks/Sussex 1978), especially ch. 1.

Institut für Philosophie
Karl-Franzens-Universität Graz
Heinrichstraße 26
A-8010 Graz
Austria