

# The Context of the Development of Carnap's Views on Logic up to the *Aufbau*

Clinton Tolley

## Introduction: The Early Carnap Between Kant and Russell

As Michael Friedman has ably described (cf. Friedman 1999), the reception-history of Carnap's 1928 *Aufbau* during the mid-century after its publication was one in which this work was seen almost exclusively as contributing an updated version of British and Austrian empiricism. In particular, Carnap's logical 'construction of the world' was seen as building off of the early-century work of Russell, especially Russell's own 'logico-constructive' programme in his 1914 *Our Knowledge of the External World*. As Friedman notes, this view of the *Aufbau*'s core sympathies was fostered and encouraged especially by the influential portrayals of Ayer, Quine, and Goodman.

Friedman has also forcefully argued, however, that such Russell-focused readings of the *Aufbau* are deeply misleading as to the true intellectual spirit of the work, since it ignores the significant role played by the Kantian and neo-Kantian problematics that animated Carnap's work and intellectual life from very early on, but especially from the time of his 1922 *Der Raum* through the composition of the *Aufbau* itself (cf. Friedman 2000: ch 5). More recently, Friedman's revisionary

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C. Tolley (✉)

Department of Philosophy, University of California, San Diego,  
9500 Gilman Drive #0119, La Jolla 92093-0119, CA, USA  
e-mail: ctolley@ucsd.edu

efforts have been further supported by the careful historico-analytical work of Alan Richardson (cf. Richardson 1992, 1998).<sup>1</sup>

For the claim that Kantian and neo-Kantian concerns play a very active role in shaping the early Carnap's views, the textual and historico-contextual evidence marshaled by Friedman and Richardson is quite compelling. It is therefore very easy to have a considerable degree of sympathy with this part of their proposal. It is less clear, though, that this evidence should compel us to *wholly* neglect what surely motivated the more familiar interpretation in the first place – namely, the *prima facie* substantial evidence Carnap is (at least) *also* directly and deeply influenced by Russell. As Christopher Pincock, for one, has emphasized, this counter-evidence includes various testaments from Carnap's own hand at the time concerning the extent of Russell's impact on Carnap's early projects, in both published work and private correspondence (not least correspondence with Russell himself), along with later retrospective portrayals of Russell's decisive influence (cf. Pincock 2002). Pincock has urged in particular that the early Carnap's concerns with presenting the 'constitution' of our 'cognition' of the physical world from an 'autopsychological' basis of elementary phenomenal contents ('*Erlebnisse*'), and the resulting re-conception of the objectivity of such cognition, bears *at least as much* affinities with Russell's own attempts in the 1910s to present the construction of our 'knowledge' of the external physical world out of sense-appearances, as it does with any particularly neo-Kantian attempts to do the same (cf. Pincock 2002: 14f; cf. Pincock 2007).

In what follows, I will sound a note of caution similar to Pincock's, by pointing to a further dimension along which Carnap's early views depart fairly directly from both Kant and the neo-Kantians, and swing much closer to Russell's – namely, in Carnap's conception of the subject-matter of the science of *logic*. For though many recognize the extent to which the *system* of logic ('logistics') that Carnap embraces is surely not Kant's – since it is indebted to advances made possible only by Russell, Frege, and others – there has been very little discussion of the extent to which Carnap's very understanding of the *subject-matter* of logic itself departs from the Kantian perspective.<sup>2</sup> For example, though Friedman himself acknowledges that, in the *Aufbau*, 'Carnap's conception of logic is that of *Principia Mathematica*' (Friedman 1999: 180), the extent to which this conception could be compatible with a broadly neo-Kantian framework is not directly addressed. This comes at a cost, for, as we will see below, the Kantian (and neo-Kantian) conception of logic is of a science primarily concerned with mental *activity* and its (ideal) *contents* (concepts, Fregean '*Sinne*'), whereas Russell takes logic to be primarily concerned with the *objectivities* which are represented by such contents through such acts – i.e., with the objects, properties, states of affairs, facts (and so on) that together constitute the

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<sup>1</sup>In this proposal for the re-framing of our engagement with the *Aufbau* through a broadly Kantian perspective, Friedman and Richardson significantly develop and vastly extend earlier sketches in this direction made in Haack (1977), Sauer (1985, 1989), Moulines (1985), and Coffa (1991).

<sup>2</sup>In fact, there has been very little discussion in general of the early Carnap's conception of the subject-matter of logic. For a very helpful discussion of Carnap's early 'system of logistics', see Reck (2004, 2007).

most general or universal features of the objective world. And while Friedman is right to claim that the early Carnap does, for the most part, embrace the Russellian conception of logic, Carnap also follows Russell in placing logic at the very basis of his own constitution programme, which has the effect of lodging non-Kantian doctrines right at the heart of Carnap's project at the time. Hence, even if we should surely welcome Friedman's and Richardson's recent contributions as a necessary corrective to the traditional one-sidedly Russell-framed interpretation of the early Carnap's views, I will conclude that it nevertheless remains correct to *also* orient our understanding of Carnap in this period, on certain key points, by reference not just to certain not-uniquely-Kantian threads that are at work throughout the *Aufbau* (as Pincock has argued), but, in the case of logic, certain decidedly non-Kantian, and decidedly Russellian, threads as well.

I will proceed as follows. In section "Conceptions of logic in the early Carnap's historical context" I will present three conceptions of logic which can be seen to flow into Carnap's early thought, based on his own reporting of influences at the time and later, as well as his published references concerning logic in *Der Raum* and the *Aufbau* (section "Finding an appropriate historical frame"):

- (i) the *mentalist* conception of logic developed by Kant, and taken up in an exemplary fashion by Natorp (section "Kant and Natorp: logic as the science of mental activity and its contents"), according to which logic is concerned first and foremost with mental acts of understanding and their ideal contents (concepts, thoughts);
- (ii) the *referentialist* conception of logic which emerges in the work of Frege and Husserl (section "Frege and Husserl: logic as the science of objective contents and their objects"), according to which the domain of logic includes not just contents (Fregean *Sinn*, Husserlian meanings) but also includes 'formal-ontological' structures (in Husserl's words), i.e., items belonging to the realm of Fregean 'reference [Bedeutung]' – though also still leaving room (however minimal) for a treatment of mental acts (of intending, referring, judging, inferring, etc); and, finally,
- (iii) the more austere *ontological* conception of logic which is developed and defended by Russell during the 1900s–1910s (section "Russell: logic as the science of the most general forms of facts (things 'in the world')"), according to which the subject-matter of logic is simply the most general features of the world itself, rather than anything mental whatsoever (whether act or content/sense).

With this framework in mind, I will then turn in section "The early Carnap's conception of logic to the three major writings of Carnap's early period which deal with the question of the subject-matter of logic: the 1922 *Der Raum*, the 1928 *Aufbau*, and the 1929 *Abriss der Logistik*. Here I will show, first, that already by the time of *Der Raum*, we find Carnap at least at one remove from the Kantian mentalist conception, insofar as he means to follow Frege and Husserl instead in including ontological concerns within logic (section "Carnap on logic in *Der Raum*"). I will then show, secondly, that by the time of the *Aufbau* and the *Abriss* at the latest, the

dominant position on logic that Carnap endorses seems to be one that moves almost all way to embracing the Russellian ontological conception, by rejecting the idea that either mental acts or thoughts have distinctively ‘logical worth’ (section “The Russellian core of Carnap’s picture of logic in the *Aufbau* and the *Abriss*”).

Because Carnap places logic at the very foundation of the *Aufbau*’s constitution project (Carnap 1928: §§106–7), I conclude that the foregoing implies that there is a set of largely Russellian and decidedly non-Kantian doctrinal commitments lying squarely at the very basis of the project itself (section “Resisting idealism: an ‘extensionalist’ conception of logic is not (neo-)Kantian). In the concluding sections, however, I turn to one final distinct thread which can be seen to be present in Carnap’s conception of logic in the *Aufbau*, one which only ever so slightly (and sketchily) begins to emerge there, as well as in an essay on concepts Carnap wrote while in the final stages of composing his book (Carnap 1927), and only finally receives considerably further development in Carnap’s subsequent work. More importantly for our purposes, it is a thread which does not seem to fit very well at all with the Russellian conception Carnap otherwise will have been shown to embrace at the time. This is:

- (iv) the conception of logic as dealing with our own (mental acts(?) of) ‘conventions’ and ‘stipulations’, rather than having any straightforwardly ontological import.

After trying to track down some of the roots of this conception in Wittgenstein and others (section “Resisting ‘realismus’: constitution, convention, and stipulation”), I will then ask whether, if fully embraced, this conventionalist conception might be viewed as drawing Carnap closer to the Kantian or neo-Kantian conception of logic after all (section “Kantian roots of the *Aufbau*’s proto-conventionalism?”). I will argue that, though this conception does bear some affinities with the Kantian one, there is still no reason to mark it out as distinctly Kantian (or neo-Kantian).

## Conceptions of Logic in the Early Carnap’s Historical Context

### *Finding an Appropriate Historical Frame*

In the Preface to the 2nd (1961) edition of the *Aufbau*, Carnap refers to Frege and Russell as the most salient influences on his conception of logic at the time, and also as providing him with the ‘insights’ about logic that ‘formed the basis of [his] book’ (Carnap 1928 [1961], xi). Frege and Russell’s key role is further confirmed by Carnap’s correspondence with Russell and others during this early period (cf. Pincock 2002), as well as by the more extensive comments Carnap made in his later ‘Intellectual Autobiography’ (cf. Carnap 1963:11–13; see also Reck 2004). It would be natural, therefore, to expect that the early Carnap’s views on logic will share especially much in common with Frege and Russell in particular.

At this point, however, three difficulties arise. The first is that it is not at all evident that Frege and Russell agree on the nature of the subject-matter of logic (cf. MacFarlane 2002; and see below section “Frege and Husserl: logic as the science of objective contents and their objects”). We will need to determine, therefore, which overlapping dimensions of their otherwise divergent views Carnap sees himself as drawing upon. A second is that a good number of these texts represent Carnap's perhaps clouded retrospection of his influences at the time, rather than his first-hand reports from the time itself. A third related difficulty is that in other earlier recordings of his influences, including other correspondence from the time and in Carnap's early references to secondary literature, we find other figures arguably taking up a significant amount of the spotlight as well. For example, as Coffa notes (cf. Coffa 1991: 207), when Carnap writes to report to Hugo Dingler in 1920 which authors Carnap is most engaged with at the time – i.e., the time when he is working out the views expressed in *Der Raum* – Carnap's list instead highlights figures such as Helmholtz, Mach, and Weyl, and also includes Kant and the neo-Kantian Paul Natorp. A similarly broad variety of references is found in *Der Raum* itself, in the part of Carnap's literature-survey that focuses on logic. There, besides Russell (and Whitehead) and Frege, we find Carnap singling out also Couturat and Husserl, along with the neo-Kantian thinkers Bauch, Cassirer, and (again) Natorp, and Kant himself (cf. Carnap 1922: 78–79, 85–85). This is in addition to the oft-noted broadly ‘Kantian’ tenor of the whole of *Der Raum* (it was published in *Kant-Studien* after all!), and the central framing role played by some of Husserl's distinctions in determining Carnap's background conception of both the relationship between the three kinds of space he identifies in the work, as well as the three disciplines which pertain to these spaces respectively (Carnap 1922: 60–61, 65).

Nor does such a breadth of references drop out once we reach the *Aufbau* itself. Though again Russell (and Whitehead) and Frege are surely given pride of place in Carnap's description of who he means to be following with respect to logic (cf. Carnap 1928: §3), Husserl, too, again comes in for positive mention in relation to Carnap's general approach to constitution-theory (ibid.), as do the neo-Kantians – now perhaps especially Cassirer, given his articulation of the philosophical significance of the theory of relations (cf. Carnap 1928: §12).<sup>3</sup>

All of this strongly suggests that the early Carnap was in fact engaged with a much richer set of perspectives on logic than those of Russell and Frege alone, and in particular was actively engaged with positions importantly distinct from either traditional or Russellian versions of empiricism – with the Kantian, Fregean, and early-phenomenological traditions perhaps standing out in particular. Yet if we were already wondering how best to understand Carnap's later claim to be deeply influenced by two authors (Frege and Russell) who don't themselves obviously agree on the nature of logic, the question returns with even more significance now that we find ourselves tasked with weaving together an even broader set of diverging perspectives.

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<sup>3</sup>For a very lively and nuanced presentation of the multi-faceted intellectual context of Carnap's early work, see (Carus 2008).

We can get some bearings by looking briefly at what would seem to be three main perspectives on logic represented in Carnap's references, in order to then see which of these provides the closest fit with Carnap's own views of logic at the time (cf. section "The early Carnap's conception of logic"). We will begin with the Kantian, broadly mentalist perspective of Kant and Natorp (section "Kant and Natorp: logic as the science of mental activity and its contents"); then turn to the more sharply de-psychologized, referentialist perspective common to Frege and Husserl (section "Frege and Husserl: logic as the science of objective contents and their objects"); and look, finally, to the more straightforwardly ontological perspective of Russell (section "Russell: logic as the science of the most general forms of facts (things 'in the world')").

### ***Kant and Natorp: Logic as the Science of Mental Activity and Its Contents***

#### **Kant**

Kant takes the traditional logic to be a 'science [Wissenschaft]' whose object is '*thinking* [denken]', considered as a specific sort of mental activity, one that is brought about by our intellect, or in Kant's terms, our capacity of '*understanding* [Verstand]' (cf. B75–76). Thinking is a species of '*representing* [vorstellen]', or the mental activity by means of which certain mental contents are used to represent further items to the mind. More specifically, thinking is representing objects, i.e., '*cognizing* [erkennen]' them, and doing so '*through concepts* [Begriffe]' (cf. B93–94; B376–77). Kant takes the paradigmatic case of representing objects through concepts to be '*judging* [urteilen]' about objects. In fact, sometimes Kant makes it sound as if our understanding cannot use concepts in any other way except in judging, and in any case holds that the capacity for thinking is also adequately understood as the capacity for judging (cf. B93–94). This also allows Kant to characterize concepts in terms of their role in judgments, insofar as they provide the 'matter' for judgments by serving as their subject- and predicate-terms, with the copula serving as the (most basic) 'form' by means of which concepts are connected into a judgment (cf. B94; B322; B141–42).

Kant's attitude toward logic is not wholly traditional, however, insofar as he proposes that we should reconceive of logic as having two central parts, in light of the two aspects of our understanding: on the one hand, its basic activity (thinking, judging), and on the other, its basic contents (concepts). Logic itself will thus have (1) a 'formal' part, which sets out to identify basic ('elementary') 'forms' of the *acts* of understanding (forms of judging), in abstraction from the kinds of matter or contents (concepts) that can be involved in such acts (cf. B76–79; Kant 1800: §I, 9:13); and then (2) a part that does not abstract from considerations of these contents, but

seeks instead to determine the basic ('elementary') contents (*concepts*; what Kant calls 'categories') which are involved in all acts of understanding. Kant's name for the first part is 'formal logic' (cf. B169–70), while he calls the second part 'transcendental' logic (cf. B79–82).

As Kant sees it (cf. Kant 1783: §39, 4:323), such a reconception is necessary because the concerns of the traditional logic have been largely restricted formal logic – i.e., the tasks of finding the basic 'forms' of judging, along with the basic 'rules' for interrelating such judgments in inferring (syllogisms). The possibility of an equally apriori inquiry into the basic concepts (or 'categories') of understanding, by contrast, is something that Kant thinks had not yet been recognized to belong to logic as the science of *thinking* – though such an inquiry had been pursued instead under the heading of *metaphysica generalis* or ontology, as the science of *being* and its basic genera (cf. Baumgarten 1779: §4). Kant faults previous attempts at an ontological grounding of category-theory on two fronts. First, he criticizes their failure to show how the knowledge they purport to have achieved could be possible *apriori*, since it would seem to require that we could have all of being itself present to mind somehow prior to actually being 'given' any particular being in an intuition or experience (cf. Kant 1783: §9). Secondly, Kant criticizes previous metaphysics for failing to provide a genuine 'principle' from which the basic categories can be derived systematically, rather than haphazardly ('rhapsodically'; cf. B107; Kant 1783: §39, 4:324).

Kant's own contention that the science of the categories should be seen as a branch of *logic* is meant to overcome both of these limitations. By showing how the relevant *concepts* of kinds of objects can be derived ('deduced') from logical *forms* of acts of understanding in judgment, Kant's account addresses the first issue by demonstrating how we could possess the relevant knowledge in question apriori: to find the basis of these basic concepts (contents) we do not need to look beyond the understanding itself, which is itself something that *is* 'given' to the mind apriori, as a part of the mind itself (cf. B159). And since the traditional logic has already shown that the forms of judgment themselves compose a system, the possibility of the deduction of the categories from such forms also shows, secondly, that the set of these basic concepts does have a systematic principle (cf. again B107 and Kant 1783: §39).

What is crucial for our purposes in all of this is that Kant conceives of both parts of logic as having a subject-matter which is available apriori, since consisting solely in the 'mental' dimensions of understanding, whether its *acts* (as in formal logic), or its representational *contents* (concepts) – *rather than* including whatever individual *things* 'in themselves' might exist or have being, in order to be thought or judged about. For Kant, it is especially important to see that this is true even of transcendental logic, since his revisionary account of the science of categories shows that what traditional ontology claims to be knowledge directly of the predicates (properties) of *things* consists instead solely in knowledge of certain conditions for our '*cognition*' (concepts) of things (cf. B113–14).

## Natorp

To many ears, Kant's use of such straightforwardly mental terms made logic sound – for better or for worse – as if it were a discipline that should be subordinated to psychology, when the latter is understood as the study of the powers and states of the soul (the science of 'psychical' phenomena, broadly construed). To be sure, Kant himself tried to head off any such subordination, at least with respect to *empirical* psychology, since (as we noted above) the subject-matter of 'pure' logic is given to the mind apriori, and so knowable 'prior' (in some sense) to any experience (cf. B77–82; Kant 1800: §I, 9:12–14). Nevertheless, many later aspiring neo-Kantians took even greater pains to distinguish the manner in which the understanding is treated in logic from how it is approached in psychology, to avoid the charge of 'psychologism' that had been leveled against Kant and post-Kantians by Husserl and others (cf. Husserl 1900–1: Prolegomena). Not least of these was Paul Natorp, who famously retorted that the neo-Kantian tradition did not have anything to learn from Husserl's anti-psychologistic arguments, since Kant's own concern, especially in his transcendental logic, was already with the determination of which 'basic concepts [Grundbegriffe]' form the 'pure' and 'objective' basis or ground for the 'basic principles [Grundsätze]' of 'basic sciences [Grundwissenschaften]' like mathematics and natural science – rather than anything subjective or particular to the psychological make-up of this or that individual (cf. Natorp 1901: especially 281f).

Even so, in his own later treatise on logic, his 1910 *Die logischen Grundlagen der exakten Wissenschaften*, Natorp follows Kant in accepting that logic itself is tasked with uncovering the 'basic acts [Grundakte]' of understanding, and the specifically logical (deductive) 'manner of proceeding [Verfahren]' in thinking (cf. Natorp 1910: 5; my ital.). What is more, Natorp also means to follow Kant in claiming that the fundamental activity of understanding is something which can be understood as a kind of 'synthesis' that is manifest in 'judgment'.<sup>4</sup> In fact, Natorp criticizes then-contemporary conceptions of logic which, in their recoil from psychologizing the logical domain, go on to entirely neglect the 'process-character of thinking', a neglect which Natorp himself means to correct (Natorp 1910: 41; cf. 18, 27).

Yet though Natorp retains a version of Kant's characterization of the subject-matter in terms of certain basic intellectual acts, Natorp is equally clear that the activity or process in question is simply not one that could be captured by the methods of psychology: 'This law-governed process of thinking [gesetzmäßigen Gang des Denkens]...is not a process in time, therefore it is certainly not a psychological or historical process' (Natorp 1910: 17; cf. 13–16). Rather, thinking is identified in logic solely as the act-correlate of certain relationships which obtain among 'what is thought [das Gedachte]', which Natorp also unpacks in terms of the 'content [Inhalt]' or 'sense [Sinn]' associated with subject-predicate structures, structures

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<sup>4</sup>To be sure, Natorp argues for a very particular understanding of the acts of 'synthesis' and 'judgment', insofar as he associates the most 'original' versions of these acts not with a 'combining' of pre-given discrete parts but with a more holistic 'determining' the parts of a whole together with the 'connection' and 'correlation' between the parts all at once (cf. Natorp 1910: 21–39).



which Natorp calls 'the possible content of an assertion [Aussage]' (cf. Natorp 1910: 37). Like Kant, however, Natorp also maintains that this basic predicative relation within the possible contents of assertions itself obtains *only because* of the nature of the 'basic' intellectual 'act' of 'cognizing' (thinking) – which allows Natorp to keep hold of Kant's thought that the basic structures of such contents ('constituents') for judgment will be 'directly derived from' this basic act – even going so far as to claim to derive the very fact that such content will consist in concepts *at all*, related in judgeable forms (cf. Natorp 1910: 44; cf. 49).<sup>5</sup>

For Natorp as for Kant, therefore, logic is concerned with both forms of activity (thinking) as well as kinds of contents (what is thought, 'sense'; cf. Natorp 1910: 7). What about Kant's exclusion of the *things* themselves (the ontological) from the domain of logic? Unlike Kant, Natorp does not appear to countenance any sharp separation of what is thought qua content from the object thought about through such content. Rather, the only 'object' for thinking is the exact 'correlate' to thinking's 'projection' (Natorp 1910: 32–34). As a consequence, Natorp holds the seemingly more radical position that 'there is for thinking no being [Sein] that would not be posited in thinking itself. [...] Logically, at least, nothing *is* before thinking. (Natorp 1910: 48). But then, because there *is* nothing to be thought beyond what is 'posited in thinking', nothing merely 'in itself' in complete detachment from thinking, logic of course cannot then be charged with the task of uncovering anything like the subject-matter of the traditional ontology (i.e., the universal predicates and laws governing things 'in themselves').<sup>6</sup>

## ***Frege and Husserl: Logic as the Science of Objective Contents and Their Objects***

### **Frege**

For Husserl at the turn of the century, and before him, for Frege, all such attempts to 'ground' logic in any sort of mental activity looked deeply misguided. Though both accepted that certain mental acts (such as judging, inferring, etc.) are of particular interest in logic, this is not because they contribute to the determination or constitution of the *contents* to which they are related, and it is especially not because they help to 'generate' or 'posit' the *objects* or things to which the mind is related through such contents. Rather, both held that such acts are coordinated with

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<sup>5</sup>This is part and parcel of Natorp's attempt to defend and further develop Kant's proposed expansion and reorientation of logic, from the traditional merely 'formal' logic of acts toward the transcendental logic of basic cognitive contents, yet to do so in a way that satisfies Kant's demand for a single principle provided by an original *activity* of understanding (Natorp 1910: iv).

<sup>6</sup>For more on the neo-Kantian rejection of the 'in itself' in this sense, and the turn toward the 'generative' conception of the objects of cognition, see (Friedman 2000: Chapter 3) and (Richardson 1998: 116f).

contents and objects whose natures and structures are what they are *independently* of the existence and nature of any such acts.

This is, of course, not to say that there are no parallels with the Kantian tradition. Like Natorp, Frege distinguishes ‘what is thought’ qua content from the mental act coordinated with it; this content is what Frege calls a ‘thought [Gedanke]’, something which serves as the ‘sense [Sinn]’ of an ‘assertoric sentence [Behauptungssatz]’ (Frege 1967: 148). Yet though Frege, too, takes ‘thinking [Denken]’ to be one of the most primitive acts of interest to logic, Frege construes thinking not as an active synthesis, but a receptive ‘grasping [Erfassen]’ of what is already there, complete with whatever constitution it has (cf. Frege 1967: 346). What is more, Frege takes thoughts themselves (and *Sinn* more generally) to be ‘modes of being *given*’ further ‘references [Bedeutungen]’ (Frege 1967: 144), rather than modes of ‘positing’ or ‘generating’ objects.

Frege takes the reference or objectivity represented (‘given’) by a whole thought to be the ‘truth-value’ of the thought, i.e., ‘the true’ or ‘the false’ (Frege 1967: 148f). Each thought, in turn, is composed of component senses which give separate references of their own, such as individuals, properties, relations, and so on. Since we will return to this issue in Carnap, it is worth noting that Frege’s terminology is a little confusing here, since he departs from the Kantian tradition (and more recent usage as well) by associating ‘concepts [Begriffe]’, not with the *content* that composes a thought, or something at the level of sense, or that by means of which a e.g., property (‘mark’) is ‘given’, but rather with something at the level of *reference*, or what is ‘given’ (represented) through the level of sense: the domain of concepts includes not representations of properties but the properties, relations, and (more generally) functions themselves (cf. Frege 1969: 96).

Even so, like Natorp, Frege, too, takes the subject-matter of logic include all three ‘realms’ (act, content, object) – at least to some degree.<sup>7</sup> That logic has to deal in some direct way with mental acts can be seen from the fact that Frege insists on including signs for certain specifically logical mental acts within his official logical notation (‘concept-script [Begriffsschrift]’) – most importantly, signs for the act of ‘judging’, the act of ‘defining’, and the act of ‘inferring’ (cf. Frege 1893: §5, §14, §27).

Despite this, however, Frege seems to think that logic’s interest in these acts does not go very far beyond noting the contents (thoughts) they are coordinated with (cf. Frege 1969: 159). What is more, when Frege describes the domain of logical laws, he describes this domain not in terms of activity but rather in terms of items have a certain kind of *being*: ‘logic is the science of the most universal laws of *being-true* [Wahrsein]’ (Frege 1969: 139, my ital.; cf. Frege 1967: 343). What has this kind of being, for Frege, are not acts of thinking or judging but their contents, i.e., thoughts: ‘the predicate ‘true’ applies to thoughts’ (Frege 1969: 142).

Yet, as the reference to truth here also makes evident, Frege also does not take logic to be concerned solely with thoughts per se, in abstraction from the question

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<sup>7</sup>For a lengthier defense of the claim that all three realms belong within Frege’s conception of ‘what is logical [das Logische]’, see (Tolley 2011).

of their reference (truth-value). Rather, logic is directly concerned with the relation between thoughts and their truth-values, and in particular, with the 'step [Schritt]' from thought to truth-value: 'logic is not concerned with how thoughts proceed from thoughts without reference to the truth-value, for the step from thought to truth-value, and more generally from sense to reference, must be taken' (Frege 1969: 133). In fact, Frege goes so far as to conclude that the realm of reference itself can thus be viewed as 'what is essential [das Wesentliche] for logic', such that 'the logical laws are first laws in the realm of references and relate only mediately to sense' (Frege 1969: 133).

With Frege, then, we see a clear shift of logic's focus from acts and contents (Kantian concepts) to the realm of their references: to those things, properties, relations, etc. represented through contents (senses). To be sure, Frege continues to follow Kant in holding the domain of logic to be something which can be known a priori, independently of what is known in experience or intuition.<sup>8</sup> Still, Frege never makes the further transcendental-idealist claim that the domain of logic is knowable a priori *because* it can be 'derived' from (a priori knowable) forms of mental activity. And though he does accept that objects in the domain of logic are 'given' to the mind through thinking and reasoning ('reason [Vernunft]') alone (cf. Frege 1884: §105), Frege does not characterize such 'givenness' as an active generation or positing by thinking itself. Rather, Frege insists that such objects are 'no more an object of psychology or a product of a psychical process [ein Ergebnis psychischer Vorgänge] than the North Sea is' (cf. Frege 1884: §26).<sup>9</sup>

## Husserl

Frege's conception of logic is therefore built upon a commitment to the objectivity and mind-independence of both the contents (thoughts) and objects (properties, relations, truth-values) in view within logic. And by making logic directly concerned with the realm of reference as well, Frege would seem to bring more squarely back into logic what had traditionally been thought of, before Kant, as the domain of ontology.

The concern for ontology within logic is made even more explicit in the kindred conception of logic developed by Husserl in his 1900–1 *Logische Untersuchungen*. Already in the Foreword, Husserl signals that he, too, will argue for the shift in

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<sup>8</sup>Like Kant, Frege distinguishes the kinds of objects we can know on the basis of the division between the different 'sources of cognition [Erkenntnisquellen]' of these objects, with the 'logical' source providing a priori knowledge of what pertains to everything 'thinkable', independently of whether it is also sensible or imaginable (cf. Frege 1884: §14, §§26–27, and §105; and Frege 1969: 286f).

<sup>9</sup>All of this suggests that we should be cautious against grouping Frege too close to Kant or the neo-Kantians, even if – as Gottfried Gabriel and Hans Sluga have argued (cf. Gabriel 1986; Sluga 1980) – there are clearly ways in the Kantian problematic leaves deep marks on Frege's own positions. For further comparison of Kant and Frege on different aspects of their philosophies of logic, see (MacFarlane 2002) and (Linnebo 2003).

logic's focus away from a concern with mental acts per se, and toward their contents and the objectivities represented through them, distinguishing 'the psychological connections of thinking [Denken]' from 'the logical unity of the content of thought [Denkinhalt]' (Husserl 1900–1: I.vii; cf. I.12–16). And, as is well-known, one of Husserl's main concerns throughout the *Investigations*' 'Prolegomena' is to combat psychologism about logic, by criticizing any view according to which the subject-matter of logic would consist solely in mental activity, its processes, or its 'products'. To this end, Husserl insists that we must take care 'not to mix up the *psychological* 'presuppositions' and 'foundations' of the *cognition* of a [logical] law with the *logical* presuppositions, grounds, of premisses of the [logical] *law*' itself (Husserl 1900–1: I.75). Similarly, we should not confuse the domain that is governed by logical laws with any domain of '*facts* [Tatsachen]', including psychological ones – with a 'fact' being understood by Husserl to consist in 'something temporally determinate [ein zeitlich Bestimmtes]' (Husserl 1900–1: I.76–77; my ital.). Logical laws, rather, 'are related in general to *truths*, and therefore have truths as the 'objects' that they govern', and 'no truth is a fact' in the sense just spelled out, since 'a truth is raised above all temporality, i.e., it makes no sense to ascribe to it temporal being, arising, or passing away' (Husserl 1900–1: I.76–77; my ital.).

As this suggests, Husserl, like Frege, takes the items which possess the right kind of 'being' to be true (or false) to be 'objects' which are distinct both from anything psychological and from any other (temporally) existing thing. These items are what Husserl (following Bolzano) calls 'propositions [Sätze]', which, though they can serve as the contents of acts of judging, are not identical with such judgments or any other mental ('psychical') acts. Rather, a proposition is 'an ideal meaning-unity [eine ideale Bedeutungseinheit]' which stands over and against an indefinite number of mental acts as their content (Husserl 1900–1: I.175). Hence, a law of logic (like the principle of contradiction) is 'not a law for the act of judgment [Urteilsact] but rather for the *content* of judgment [Urteilsinhalt]...that we call propositions' (Husserl 1900–1: I.176; cf. I.70).

While this might suggest that Husserl takes logic to focus solely on the realm of Fregean thoughts, Husserl, like Frege, holds instead that 'ideal validity' cannot be 'supplied' to 'acts of thinking' through a self-standing realm of propositions or truths, but only by the 'objective' *relation* that this realm of contents bears to the realm of '*things* [Sache]' that they represent truly (Husserl 1900–1: I.228). In this way, Husserl likewise takes the 'objective connection' to which acts of thinking are related to be 'twofold': on the one hand, there is the 'the objective connection of *things*, to which the phenomena of thought [Denkerlebnisse] (those actual or possible) are intentionally related', and 'on the other side there is the connection of *truths*, in which the unity of things comes to objective validity, as what it is' (Husserl 1900–1: I.228). What is more, Husserl takes these two dimensions (the true contents (propositions) and the things of which they are 'valid') to be 'given with one another apriori and inseparable [unablösbar] from one another' (Husserl 1900–1: I.228–9). Insofar as logic is concerned with the laws which govern truths, then, it is also concerned with the objective connections that constitute the things which such truths allow us to intend 'validly'.

For this reason, Husserl holds that logic itself will have to investigate *both* 'the concepts: concept, proposition, truth, etc.', or what Husserl calls 'the categories of meaning [Bedeutungskategorien]' (where '*Bedeutung*' is used in a non-Fregean way, as interchangeable with 'sense'), *as well as* 'other concepts that stand in correlation with these, such as: object, state of affairs...and so on', which Husserl calls 'the pure or formal *objectivity*-categories [gegenständlichen Kategorien] (Husserl 1900–1: I.244; my ital.). Later Husserl will mark the presence of the second set of categories (something, object, etc.) within logic by claiming that logic itself contains 'formal *ontology*' as one of its branches, the one which presents 'axioms concerning the logical essence of object-in-general', with the science of the 'meaning-categories', by contrast, being assigned to the branch of specifically 'apophantic logic', which treats instead of 'the essence of the proposition' (Husserl 1913: §10, 23).<sup>10</sup>

Finally, again like Frege, and against Natorp, Husserl is quite explicit about the fact that we stand in a receptive rather than productive relation to both apophantic-logical contents and formal-ontological objectivities. We are 'given' such ideal contents and 'formal' objectivities in what Husserl initially calls 'universal [allgemeiner] intuitions' (cf. Husserl 1900–1: II.478), and later calls 'eidetic grasping [Wesenserschauung]' (cf. Husserl 1913: §3). Husserl admits that these intuitions contrast with sensory intuitions of concrete individuals as to (a) the nature of their objects, since they have 'universal objects' rather than individuals), and (b) which mental acts need to prepare the way for such intuitions, since they must be preceded by an act of abstraction, in order to yield a 'sensitivity formed by categorial acts' (Husserl 1900–1: II.477). Nevertheless, universal intuitions are like sensory intuitions in that they, too, immediately and directly present us with their objects, objects whose natures are what they are regardless of our own mental activity – and so, objects which are in no way 'produced' by our mental activity, but are rather 'adequately' and 'originally given' as they are (Husserl 1913: §3).

### ***Russell: Logic as the Science of the Most General Forms of Facts (Things 'in the World')***

Implicitly in Frege and explicitly with Husserl, then, we see an incorporation of the traditional concerns in ontology (and for Husserl, the name itself) within logic. To be sure, both keep some degree of faith with the conception of logic held by Kant (especially his transcendental logic) by claiming that logic is also concerned with the domain of ideal contents (concepts or senses, propositions or thoughts, truths, etc.) by means of which objects, properties, states of affairs, etc. are represented ('intended'), and by allowing an at least residual reference to the mental acts which engage with such contents. Nevertheless, both advocate a shift of focus in logic to

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<sup>10</sup>For more on the relation between logic and ontology in Husserl, see (Smith 2007).

orient its subject-matter in a way that incorporates a doctrine of the references or objectivities represented through such contents in such acts.

If we now turn to Russell, however, we find a conception of logic that contrasts even more sharply with the Kantian tradition, insofar as Russell effectively restricts logic's concerns *only* to the objectivities represented through mental contents in mental acts – i.e., items at the level of objects, properties, facts, etc. – and relegates concern with either mental acts or their so-called contents entirely to psychology. This emerges directly in Russell's correspondence with Frege, where he distinguishes his own views on the content and object of mental acts as follows:

One does not assert the thought [Gedanke], for this is a private psychological matter; rather, one asserts the object of the thought, and this is, in my opinion, a certain complex (an objective proposition, one could say), in which [e.g.] Mont Blanc itself is a component. If one does not concede this, then one would have to conclude that we don't know anything at all about Mont Blanc itself. Because of this, for me the reference of a proposition is not the true [das Wahre], but rather a certain complex that (in the given case) is true. In the case of a simple proper name like 'Socrates' I cannot distinguish between sense and reference; I see only the idea [Idee], which is psychological, and the object. Better put: I do not accept sense at all, but rather only the idea and the reference. (Frege 1969: 250–51)

As we see here, Russell rejects the very notion that senses or thoughts could be objective non-psychological contents. There is only the 'psychological' act or state (the 'idea' as a private psychological matter), on the one side, and then, on the other, items at the level of Fregean reference: e.g., the object (e.g., Mont Blanc) or a 'complex' (state of affairs, fact) in which it is a constituent.

Given this rejection, it is unsurprising that Russell later goes on to describe logic as a science which is concerned with certain kinds of objects, relations, and facts, rather than with anything akin to Fregean sense:

I think one might describe philosophical logic...as an inventory, or if you like a more humble word, a "zoo" containing all the different forms that facts may have. In accordance with the sort of realistic bias that I should put into all study of metaphysics, I should always wish to be engaged in the investigation of some actual fact or set of facts, and it seems to me that that is so in logic just as much as it is in zoology. In logic you are concerned with the forms of facts, with getting hold of the different sorts of facts, different logical sorts of facts, that there are in the world. (Russell 1918: 80)

'Realistic' here is meant to contrast with the subjective-idealistic tendencies that Russell finds enmeshed in the views of many philosophers after Kant – and even, it would seem, in Frege's, insofar as Frege's position is criticized for placing objects and states of affairs beyond the reach of knowledge, by placing something ideal (mental, psychological) and (as Russell sees it) obstructively in the way, as an intermediary. On the 'realistic' picture, rather than focusing on psychological contents, logic will be concerned directly with objectivities ('facts'). For this reason, logic should be seen as a branch of the 'study of metaphysics', and the particular subject-matter that logic treats of is every bit as 'real', as mind-independent, as much a part of what there is 'in the world', as what zoology studies.

This passage also indicates what particular subject-matter Russell takes logic to have – what he here calls 'the *forms* of facts'. Logic first provides an 'inventory' of

such forms, and then goes on to state facts about such forms – what Russell later calls ‘*completely general facts*’ – in which ‘there is no mention of any constituent whatever of the actual world, no mention of any particular thing or particular quality or particular relation, indeed strictly you may say no mention of anything’ (Russell 1918: 42). Logical facts are special in that they do not include as constituents anything ‘particular’ – neither particular things like Mont Blanc, particular qualities like whiteness, nor particular relations like being to the left of something. Rather, they include only what might be called ‘formal’ properties and relations – i.e., the form of a particular bearing a property, the form of two particulars being related, etc. (Russell 1918: 105). This formality is something we can see witnessed in the linguistic expressions – what Russell at the time calls ‘propositions’ – through which we can mean or intend such *logicalia*, i.e., in ‘logical propositions’ like: ‘If one class is part of another, a term which is a member of the one is also a member of the other’ (Russell 1918: 42). Such propositions ‘do not mention anything’ particular but refer only to various generic forms of particularity – what Russell above grouped under the heading of ‘the forms of facts’. What allows them to do so is that such propositions ‘contain only *variables* and nothing else at all’ (Russell 1918: 104; my ital.).

Though ‘it is not a very easy thing to see what *are* the constituents of a logical proposition’, Russell thinks that logical propositions are therefore to be ‘interpreted as being *about* forms’, which are in turn somehow ‘general’ (Russell 1918: 106; my ital.).<sup>11</sup> Yet whatever such formal-generic items are, one point that Russell is absolutely firm on (and here he agrees with Frege and Husserl) is that these items are not made by the mind but are there to be given to or ‘seen’ by the mind in acts of ‘acquaintance’. This comes out quite clearly in Russell’s statement in Preface to the *Principles of Mathematics* of the task of philosophy of logic in relation to the ‘indefinables’ of logic:

The discussion of indefinables – which forms the chief part of philosophical logic – is the endeavour to see clearly, and to make others see clearly, the entities concerned, in order that the mind may have that kind of acquaintance with them which it has with redness or the taste of a pineapple. (Russell 1903: v)

The same view is also present in Russell’s unpublished discussion of our relation to logical forms in his 1913 manuscript. Here again Russell insists that the mind must have ‘acquaintance’ with distinctly ‘logical objects’ and ‘logical forms’ in particular – despite these objects being ‘peculiar’ when contrasted with ordinary sensible objects (cf. Russell 1913: 91f). Like Husserl, Russell accepts that such ‘seeing’ might require preparatory mental acts of ‘analysis’ to enable the entities in question to be perceived (Russell 1903: v). Nevertheless, these acts in no way ‘generate’ their objects; rather, like the preparatory acts that enable the perception of planets, they enable their ‘discovery’ (ibid.).

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<sup>11</sup> For more on the interaction between formality and universality in Russell’s conception of logic, see (Proops 2007: 12f).

**Table 1** Conceptions of logic among Carnap's influences

	(i) Kant	Natorp	(ii) Frege	Husserl	(iii) Russell
Act	<i>Thinking, judging</i>	<i>Thinking, synthesis</i>	Grasping, judging, asserting	Thinking, judging	Thinking, asserting
Content	<i>Concepts, judgments</i>	<i>What is thought</i>	<i>Sense (thought, truth)</i>	<i>Ideal meaning (concept, proposition, truth)</i>	Idea
Object	Things	<i>Objects-as-'posited'-by-thinking</i>	<i>Reference (objects, truth-values)</i>	<i>Objectivity (object, state of affairs)</i>	<i>Object, complex, fact (forms)</i>

Simplifying considerably, we can summarize the foregoing by coordinating the three different conceptions of logic we have canvassed here (Kantian, Fregean-Husserlian, and Russellian) in the following manner, with italics marking which domains each thinker takes to be among the primary subject-matter of logic (Table 1).

With this classification-scheme in hand, we can now turn to the task of comparing the conceptions of logic among Carnap's self-identified influences with the one that emerges in Carnap's own writings, to see which if any of these conceptions is the closest to the one Carnap himself would seem to endorse.

## The Early Carnap's Conception of Logic

### *Carnap on Logic in Der Raum*

In his 1922 *Der Raum*, Carnap spells out his views on logic most clearly in the course of discussing what he there calls '*formal space*'. This is a space whose axioms 'are derived solely from logical axioms' (Carnap 1922: 63), which gives the space itself a 'logical closedness and rigor' because it is 'free from non-logical (intuitive or experiential) components' – and so, has only distinctively logical components (Carnap 1922: 8). In Carnap's description of what these logical components are, we find clear echoes of Russell's description of 'general facts':

Formal space is a universal order-configuration [Ordnungsgefüge] of a certain kind. By "universal order-configuration" we understand a configuration of relations – not between determinate objects of a sensible or non-sensible domain, but between thoroughly indeterminate relata, about which it is only known that from one kind of connection another kind of connection follows in the same domain. Formal space, therefore, deals not with the figures usually designated as spatial, triangles, circles or the like, but with meaningless relata, in whose place the most unhomogeneous things can occur (numbers, colors, degrees of kinship, circles, judgements, people, etc.). (Carnap 1922: 6)

Formal space is a more generic, less 'determinate' structure ('order-configuration') than either the 'space of intuition' or 'physical space'. Though the structures of intuitive and physical 'spaces' are themselves instantiations of formal-spatial order-



configuration, formal space is the kind of structure whose relation-terms can be instantiated by things not traditionally considered to be spatial in the sense relating to sense-perception (e.g., numbers) (cf. Carnap 1922: 60–61). The theory of formal space, therefore, will not 'mention' any of these particular instantiations of this structure, but will remain at the level of the 'general theory of relations' – which Carnap here aligns with 'formal logic' (Carnap 1922: 8) – and 'develop' ('construct') this space from these abstract formal-logical materials alone, by 'deriving' its 'propositions [Sätze]' (axioms, theorems) from 'the basic laws of deductive logic' (Carnap 1922: 62). Since its 'propositions' – by which Carnap, like Russell, means linguistic expressions (cf. Carnap 1922: 9f) – can be deduced from formal-logical laws alone, formal space itself is a purely formal-logical object.

Now, the theory of formal space is, in fact, not the 'most general' branch of logic, because the deduction (derivation, development) of this theory takes the form of singling out certain slightly more determinate kinds of relations (ones, e.g., that determine a continuous ordered series) from among the even more universal domain of relations in general. What is important for our purposes is what this implies about Carnap's views of the formal logic from which the more specific theory of formal space is derived. For this shows, first, Carnap takes formal logic itself to include the science of the fully universal domain of relations as such. Yet since this part of formal logic will therefore have an even more general or universal domain than the theory of formal space, its axioms and propositions will likewise not make mention of any particular fully determinate individual or relation, but rather – even more so than those of formal space – must refer only to 'indeterminate' relation-constituents. This line of thought also suggests, secondly, that the general theory of relations itself might only be only one part of formal logic, insofar as there may be a still *more* universal domain within which all relations are subsumed as a special case. This would imply that even the theory of relations itself must be 'constructed' (developed, derived) out of still more universal formal-logical propositions.

When we look to Carnap's own explicit discussion of 'the construction [Aufbau] of formal logic', what we find is something very much along these lines:

We begin the construction [Aufbau] of formal logic with the undefined basic concepts "true" and "false". Anything that is either true or false we call a *judgment* [Urteil]. A concatenation of signs, in particular written signs, that designates [bezeichnet] a judgment is a (complete) *proposition* [Satz]. If we remove a component with independent reference [Bedeutung] from such a concatenation, marking the gap that results, this "incomplete proposition" no longer designates a judgment. [...] We thus see that the incomplete proposition, though not designating a judgment, possibly (or potentially) contains, so to speak, various judgments, depending on what is inserted into the gap, and so is not meaningless [bedeutungslos]. We say it designates a "*concept* [Begriff]". [...] Just as an incomplete proposition with one argument place designates a concept, one with two argument places designates a *relation* [Beziehung]. (Carnap 1922: 9–10)

Here the very concept of a relation as such is defined by way of more primitive logical terms (the concepts: true and false, judgment, proposition, etc.). And while this construction or derivation of the notion of a relation is not explicitly put in terms of a determination or specification of something more general, it is clear that Carnap

is implicitly conceiving of relations as members of a more universal domain – namely, the domain of component parts of what he here calls ‘judgments’. To avoid terminological confusion, we should note that what Carnap has in mind here by ‘judgment’ is more properly thought of as what Frege means by the *reference* of the thought grasped and asserted in an act of judging, rather than any activity on the part of the mind – despite the fact that in Kant’s, Natorp’s, Frege’s, and Husserl’s lexicons, ‘judgment’ is used to refer to just such an act.<sup>12</sup> This is indicated by Carnap’s identification of the constituents of judgment (‘concepts’ and ‘relations’) with what are ‘designated’ by, or serve as the ‘reference [Bedeutung]’ of, the parts of incomplete propositions, and his subsequent association (a few pages later) of the names which are ‘inserted’ into such incomplete expressions as items which ‘designate’ or ‘refer’ to ‘objects’. All of this, of course, mirrors the terminology used by Frege, who was one of Carnap’s teachers, for the relation of language to *reference*, not its relation to mental acts or to component-senses of thoughts.<sup>13</sup> This is also indicated, furthermore, by Carnap’s claim later in the work that the pure theory of relations, of which the theory of formal space is one branch, is parallel to Husserl’s ‘formal ontology’ (cf. Carnap 1922: 60–61) – rather than, say, Husserl’s ‘apophantic logic’ as a pure ‘theory of meaning’ (or pure ‘grammar’).

### *The Russellian Core of Carnap’s Picture of Logic in the Aufbau and the Abriss*

By the time of the *Aufbau*, Carnap comes to make more explicit use of Fregean distinctions to specify the subject-matter of logic as the realm of reference rather than that of act or sense. Though in this work Carnap gives a fairly sustained presentation of Frege’s distinction between *Sinn* and *Bedeutung* (cf. Carnap 1928: §44), Carnap continues to skip over the level of sense in his own exposition of the ‘formal-logical’ basis of the *Aufbau* itself. Carnap focuses instead only on signs and what they ‘designate’, i.e., their ‘reference’ – whether this consists of individuals, properties or relations (‘functions’), or whole ‘assertions’, here understood as what is designated by whole propositions (cf. Carnap 1928: §26 et seq).

We find the same disregard for act and sense in the *Abriss*. Here Carnap claims that what is of fundamental interest for logic ‘is something which is either true or false’, what Carnap here also calls an ‘assertion [Aussage]’, a term which Carnap explicitly claims ‘do[es] not mean the historical *act* of speaking, thinking, representing, but rather the timeless *content* [zeitlose Inhalt]’ (Carnap 1929: §2b; my ital.). Yet though (as we saw above) ‘content’ was used in previous authors to pick out something on the level of Fregean sense, Carnap here describes what he means

<sup>12</sup>This is true as well of the use of ‘judgment’ by Russell and Whitehead in *Principia*.

<sup>13</sup>For evidence that Carnap was at this time intimately familiar firsthand with Frege’s distinctions and terminology, compare the transcripts of Frege’s lectures on logic that Carnap made while attending Frege’s lectures (cf. Reck and Awodey 2004).

by 'content' solely in terms of what signs 'designate', their 'references', e.g., objects, functions, and assertions as well (cf. Carnap 1929: §2a and §2c). Note, then, that an 'assertion [Aussage]', too – like a 'judgment' in *Der Raum* – is here specified as something on the order of objects and functions and not Fregean thoughts (or acts).

In fact, not only does Carnap *not* focus on the level of Fregean *Sinn* in his initial discussions of formal logic in the *Aufbau*, when he does bring up *Sinn* later on in the work, Carnap does so only to claim fairly directly that consideration of sense is of no importance for logic, because the *only* specifically 'logical worth [logische Wert]' of a sign lies in its 'reference', as opposed to its sense, which supplies instead its 'cognitive worth [Erkenntniswert]' (Carnap 1928: §50). Sense only becomes of interest, thinks Carnap, when we are trying to convey more than just the references, e.g., in literary translation (cf. Carnap 1928: §51). The inquiry into sense (and translation) will, however, not be logical but '*psychological*' (cf. Carnap 1928: §50). All of this comes together and is telescoped in Carnap's description of the *Aufbau*'s 'method of constitution' as 'extensional' (Carnap 1928: §45).

With such eschewing of sense, we already see Carnap moving past Frege (and Husserl) and toward Russell (cf. section "Russell: logic as the science of the most general forms of facts (things 'in the world')"). Carnap draws even closer to Russell in his account of what distinguishes distinctively logical 'concepts' and 'assertions' from others:

Logic is, in general, not a proper [eigenes] domain, but contains those assertions, which... hold of objects from *any arbitrary* domain. From this it follows that it must directly concern itself with concepts which can be applied to *any arbitrary* domain. (Carnap 1928: §154)

Like Russell, we here find Carnap signaling the distinctive feature of logic as the absolute *generality* of the validity of its assertions (Russellian 'facts') and the extension of its concepts (properties, relations). Furthermore, we also find Carnap following Russell in describing this feature of logic's subject-matter in the language of '*form*' as well (cf. Carnap 1928: §46). For Carnap, too, a logical form is displayed by transforming linguistic expressions of assertions (i.e., transforming sentences or, in Carnap's terms, 'propositions [Sätze]') through the replacement of determinately meaningful terms with undetermined ('variable') signs, to yield the 'logical skeleton' of the sentence, which then 'designates' the logical form itself:

The 'logical skeleton' of a proposition designates its logical construction-form [Aufbauform], in abstraction from the reference of the non-logical concepts which occur in it. The logical skeleton of a determinate proposition can be manifest through the following: in the proposition every non-logical concept is replaced with a variable; so, the proposition, e.g., 'I see you', in logical language, 'a sees b', would yield the form: xRy. (Carnap 1929: §41)

The 'skeleton' that results consists entirely in 'logical signs', and what is 'expressed' through the resulting skeleton are 'the logical relations between the non-logical concepts' (Carnap 1928: §46). And as with Russell, what the form is a form of is not something in the realm of sense but rather something at the level of reference: a relation between concepts (functions), obtaining within 'assertions [Aussagen]', understood in the manner sketched above (ibid.) – and so, something akin to a Russellian 'form of facts'.

**Conclusion: Retaining (Though Complicating) the Early Carnap's Russellian Heritage**

***Resisting Idealism: An 'Extensionalist' Conception of Logic is not (neo-)Kantian***

In light of the foregoing, we can now put Carnap's early conception of the subject-matter of logic into a parallel chart-form as follows (Table 2).

If this is right, then we should conclude that in his early conception of logic, Carnap was clearly much closer to Russell than Kant or the neo-Kantians – or even Frege or Husserl, for that matter (cf. Table 1 above). For Carnap as for Russell, logic is not concerned either with the nature of certain mental activities or with the cognitive contents grasped in such activity, but rather with certain objectivities (properties, relations, functions, facts) which are given or meant through such contents in such acts.

This, in turn, is of consequence for our general picture of the *Aufbau* for the following reason. It is precisely the subject-matter of logic ('the logical objects or objects of pure logic') that, for Carnap, must be in place as the absolutely first ground in the constitution-system of the *Aufbau*, as something in view *before* introducing whatever further non-logical 'basic elements or concepts' and 'basic relations' (cf. Carnap 1928: §107), and it is precisely the 'axioms' that constitute this domain (of logic) that allow for the 'deduction' of further 'theorems' from whatever non-logical elements, concepts, and relations are introduced (cf. Carnap 1928: §106). In other words, it is precisely Carnap's non-Kantianism about logic that underwrites the 'extensional method of constitution' of the *Aufbau as a whole*. The significance of Carnap's non-Kantianism would therefore seem to run quite deep indeed.

Such a conclusion speaks against any aggressive attempt to fully reorient our interpretive approach to Carnap's work of this period by looking more exclusively to the Kantian and neo-Kantian context in which Carnap's thought developed, and away from the influence of Russell in particular. To accept this, of course, is in no way to deny that Friedman and Richardson are right to hold there are *other* Kantian (and Husserlian (cf. Roy 2004)) threads that run through the *Aufbau*. It is, rather, just to insist (with Pincock) that we would lose something of absolutely crucial importance if we let go of the idea that there are genuinely and distinctively Russellian dimensions to Carnap's positions at the time, and that these dimensions flow from core commitments that lie at the very foundations of Carnap's emerging programme to present the *logical* 'construction' or 'constitution' of 'the world'.

**Table 2** Carnap's early conception of logic

		of interest to
Act	Thinking, judging	Psychology
Content	Fregean <i>Sinn</i> , what is of 'cognitive' worth	Psychology, literature (translation)
Object	Fregean <i>Bedeutung</i> , what is of 'logical' worth	Logic

### ***Resisting 'Realismus': Constitution, Convention, and Stipulation***

Our analysis would end here, with Carnap in the *Aufbau* embracing a broadly 'realist' conception of the subject-matter of logic – save for one last set of very provocative and importantly divergent remarks Carnap makes about the subject-matter of logic in *Aufbau* §107. For these remarks introduce a *second* strand of thought about logic, one that only just begins to emerge, ever so slightly, by the time of the *Aufbau* and the *Abriss*, and is in fact already hinted at in Carnap's 1927 essay '*Eigentliche und Uneigentlich Begriffe*' ('Proper and Improper Concepts'), but then is only taken up and developed in detail and rigor in *Syntax*.<sup>14</sup> For in §107 Carnap now describes logic as (a) dealing with *tautologies*, or with linguistic expressions whose truth or falsity we can come to know by virtue of *their* form alone, and whose truth or falsity seems to depend in no way on how things are outside of the realm of expressions; and also (more importantly) as (b) dealing with expressions whose meaning does not seem to come from 'designating *objects*' at all, but comes rather from the *conventions* or stipulations we have made about the use of expressions:

Logic (including mathematics) consists only of *conventional stipulations* [konventionellen Festsetzungen] about the use of signs and of tautologies on the basis of these stipulations. Hence the signs of logic (and mathematics) *do not designate objects*, but rather serve only for the symbolic fixing [Festlegung] of these stipulations. (Carnap 1928: §107; my ital.)

As Carnap explains the idea in the *Abriss*, the term 'tautological' applies to propositions captured by logical sentences such as, e.g., 'if *p* and *q*, then *p*', which are, strictly speaking, 'empty of content [inhaltsleer]', because no determinate 'state of affairs [Sachverhalt]' is referred to by its expressions (which are variable-signs); no determinately contentful signs occur in them besides the ones designating the 'logical relations' (Carnap 1929: §4b). In the 1927 essay on concepts, Carnap goes a bit further, explaining that because the 'so-called cognitions of formal concepts' like those in math and logic 'are tautologies' (Carnap 1927: 373), and the logical and mathematical propositions are 'mere tautologies', they fundamentally contrast with propositions that are genuine 'assertions *about actuality* [über die Wirklichkeit]' (Carnap 1927: 362; my ital.). What is more, though Carnap accepts that these formal concepts can '*help* to assert something about actuality', he here insists that they do this only by helping to '*form* [formen] the assertion', since '*nothing* in actuality corresponds to them' (Carnap 1927: 358; my ital.).

In fact, once we return to the *Abriss*, we can see Carnap drawing out this characterization of tautologicality in his account of the grounds for the *truth* of purely logical propositions. Though they do not refer to anything in reality (actuality), Carnap does not take this to render sentences which contain purely logical or mathematical expressions entirely 'sense-less [sinnlos]', since they do convey or express

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<sup>14</sup>As Friedman aptly notes, in the *Aufbau* Carnap 'does not in any way engage with the issues actually involved' in systematically following through with this conception (Friedman 1999: 180; Friedman 2000: 122n175).

something that we can see has 'validity [Geltung]' and is 'necessarily true'; it is just that the ground of this validity or truth, however, is something that lies wholly internal to these sentences: they are 'necessarily true on the basis of [the sentences'] mere form' (Carnap 1929: §4b).

What is striking, furthermore, is that Carnap also goes on to signal here that he ultimately views the formal, tautological character of logical assertions as *more* 'essential [wesentlich]' to their logicity than their alleged generality (cf. Carnap 1929: §4d). This prioritization of tautologicality and truth due to form alone rather than referentiality would seem to represent an important shift away from his earlier Russellian characterization of logic as having unrestricted universality.<sup>15</sup>

This, however, is arguably not as severe a shift as the *second* component of the take on logic presented in *Aufbau* §107, one which (unlike tautologicality) also does not seem to have any anticipation in Carnap's earlier writings (e.g., the 1927 'Concepts' essay). This is Carnap's claim in §107 that meaning is conferred on logical sentences not from their designating objects *at all* – not even from designating Russellian 'forms' of objects – but instead from our own 'conventional stipulations about the use of signs'. For with this, Carnap would seem to shift the domain of 'the logical' completely away from that of the formal-structural features present in 'the realm of reference' (away from what is 'in the world') and toward our own mental *activity*. Not only are logical propositions not 'about' any particular states of affairs, they are not 'about' general facts or forms of facts either.

One important consequence of this, for the Carnap of the *Aufbau*, is that logical propositions are ruled out from expressing (or 'presenting [darstellen]') *cognitions*, since conventional stipulations in general are not cognitions (cf. Carnap 1928: §103).<sup>16</sup> More specifically, logical expressions do not even present us with cognition *of our own activity* (a kind of 'self-cognition'), since they do not 'refer to' or 'designate' these or any other objects whatsoever. Rather logical expressions as a whole now are seen to have only a fully 'non-cognitive' significance.

Though the upshot of this thread is not fully developed until later works, having it in focus might give us some clue as to Carnap's equal hesitation to embracing a more Russell-like 'Realismus' concerning the dependence-relations that he means to put on display in the *Aufbau*. For while Carnap is clear that does not opt for the more idealist neo-Kantian term 'production or generation [Erzeugung]' of objects and relations to describe what is involved in the work,<sup>17</sup> Carnap also takes pains to emphasize that he does not opt for the alternative 'realistic' portrayal of our relation to the relevant subject-matter – namely, that the subject-matter in question is already present and given, to simply be 'cognized [erkannt]' by us (Carnap 1928: §5). Taking exactly this 'realistic' option, however, would be what would keep Carnap

<sup>15</sup>This is so, even if in the *Aufbau* Carnap nevertheless seems to run tautologicality and generality together (cf. Carnap 1928: §154).

<sup>16</sup>One might see this hinted at in the 1927 'Concepts' essay, where Carnap speaks of mathematical and logical (tautological) propositions as '*so-called* cognitions from formal concepts' (Carnap 1927: 373; my ital.).

<sup>17</sup>This has already been usefully highlighted by Friedman himself (cf. Friedman 2000: 70–80).

closer to Russell's insistence that we bear an essentially receptive acquaintance-relation to the logical primitives and forms (cf. section "Russell: logic as the science of the most general forms of facts (things 'in the world')"). Carnap, by contrast, here chooses what he describes at the time as the more 'neutral' term, 'constitution', for the relation in question – though we can now see that he seems to have deeper motives for rejecting the idea that we are ultimately 'cognizing' something *at all*, even in logic.<sup>18</sup>

### ***Kantian Roots of the Aufbau's Proto-Conventionalism?***

Where does this non-cognitive, tautological-conventionalist account of logic come from? *Prima facie*, its roots do not trace from any of the three streams of influence discussed above. What is more, further inquiry shows that it actually doesn't seem to have been taken from any of the authors Carnap lists as influences either at the time or in his reminiscences.

Aside from partial 'conventionalist' precedents in physics and geometry,<sup>19</sup> the closest parallel is surely the conception of logic put forward in Wittgenstein's *Tractatus* (cf. Friedman 1999: 180). This is perhaps unsurprising, since, in his later reminiscences of his early influences, Carnap claims that, besides Frege and Russell, Wittgenstein 'perhaps...had the greatest influence on my thinking' (Carnap 1963: 25). More specifically, Carnap recalls that it was Wittgenstein in particular who argued for 'the more radical form' of the view of logic, only partially anticipated in Frege and Russell (and Schlick), 'that all logical truths are *tautological*, that is, that they hold necessarily in every possible case, therefore do not exclude any case, *and do not say anything about the facts of the world*' (Carnap 1963: 46, my ital.; cf. Friedman 1999: Ch 8).

What is more, when we turn to the *Tractatus* itself, we find Wittgenstein making very suggestive remarks which might seem to carve out just such a proto-§107 role for *conventions* in determining logical forms via replacements of constants with variables. For Wittgenstein, too, also claims that the manner in which something like a logical skeleton is carved out, as it were, of a proposition, is something that happens due to our 'stipulation [Festsetzung]' or 'arbitrary agreement', rather than something that is due to the inner nature of what is meant by the relevant complex of signs (cf. Wittgenstein 1922: 3.315–316). And Wittgenstein also claims that the stipulation itself only characterizes the set of signs ('symbols') in terms of their own

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<sup>18</sup>Note that Carnap claims that even in the case of 'logical objects', we still require a 'construction [Aufbau]' (Carnap 1928: §107).

<sup>19</sup>Also notable are the conventionalist perspectives about the foundations of science found in Henri Poincaré and Hugo Dingler, whom Carnap singles out in his 'Autobiography' as being especially responsible for the 'conventionalist attitude' he embraced concerning the foundations of physics in particular (cf. Carnap 1963: 14). Neither Poincaré nor Dingler, however, held that *logic* was conventional (cf. Carus 2007: 119; Friedman 1999: 83).

(syntactical) properties rather than in terms of ‘what is designated [das Bezeichnete]’ or their ‘reference [Bedeutung]’ (cf. Wittgenstein 1922: 3.317; 5.501).

Yet while such remarks surely places Wittgenstein much closer to Carnap, and makes good sense of Carnap’s reminiscences, the anticipatory parallels eventually run out. This is because Wittgenstein continues on to make the following crucial qualification, concerning what happens when we finally display the purely logical skeleton of a proposition, by ‘turning into variables *all* the signs in it whose reference has been arbitrarily determined’: we uncover something that ‘is *not* dependent on any agreement [Übereinkunft], but solely on the nature [Natur] of the proposition’ – namely, something which ‘corresponds to a logical form – a logical prototype [Urbild]’ (Wittgenstein 1922: 3.315; my ital.). Wittgenstein therefore appears to separate the special case of the *ultimate* carving out of a purely logical skeleton from the initial or *partial* determinations of propositional forms that still include non-logical components. In the purely logical case, when we arrive at the presentation of a ‘logical form’, we are presenting or displaying something that depends *not* on our conventions or agreements, but rather on the ‘nature’ of the proposition itself. Furthermore, exactly this logical form (of the proposition, of the logical ‘picture’) is itself something that Wittgenstein claims is also mirrored or even shared ‘in’ the world itself, something it ‘has in common with actuality [Wirklichkeit]’ and is in fact itself ‘the form of actuality’ (Wittgenstein 1922: 2.18). However this all might work, and however different the *Tractatus*’s ultimate picture of logic is from that of Russell’s own, none of these features seem to fit well with the sentiment expressed in *Aufbau* §107.

If we agree that it departs in crucial ways from the Russellian conception put forward in the rest of early Carnap’s writings and the rest of the *Aufbau* itself, we can conclude by asking whether the tautological-conventionalist conception of logic Carnap expresses in this section is properly thought of as *Kantian* in any respects. Concerning tautologicality, we might note that Kant, too, holds that certain judgments – i.e., analytic judgments – can be known to be true simply on the basis of the consideration of the *form* of the relations among their contents (concepts), with logical laws (of identity and contradiction) supplying the ‘supreme principle’ for the cognition of the truth of such judgments (cf. B189f; Kant 1800; §VII, 9:52f), and with such truth not appearing to depend on any further reference or relation that such contents might have to objects in the world (e.g., via intuition). Concerning conventionalism, it is at least true that Carnap here does draw closer to Kant’s original conception by now identifying mental *activity* as the central component for supplying logic with its subject-matter.

What does not seem to find any parallel in Kant, however, is the specifically *conventionalist* or stipulationist dimension of this alternative conception. If anything, Kant would seem to be more like Wittgenstein of the *Tractatus*, in holding that logical forms structure whatever they structure *necessarily*, independently of whatever else we might determine about cognitive contents (or their expression in language) conventionally or through stipulation. For Kant, the reason that logical forms are what they are lies not in any decisions we make, but rather in the essential nature of the underlying capacity for thinking, i.e., in the nature of the kinds of



activity that our understanding is capable of performing (B95f). In this respect, logical forms and the laws that govern them are 'given' to each of us by our understanding, rather than being made or instituted by anything we do or decide.<sup>20</sup>

Even here, then, in the incipient conventionalist conception of logic gestured at in *Aufbau* §107, I think we must conclude that Carnap's conception of logic in the *Aufbau* departs in crucial ways from the Kantian tradition – even if we accept that it is equally non-Russellian as well. Hence, whether it emerged as something entirely idiosyncratic to Carnap at the time, as an initial anticipatory sketch of the revolutionary doctrine of 'tolerance' in logic that he would more famously and influentially elaborate several years later in *Logical Syntax*, or whether it has its roots in other, currently uncharted influences, it too signals another non-Kantian note close to the core of the fabric of the *Aufbau*.

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<sup>20</sup>In fact, though Kant rejects the idea that we have any representations present in our minds 'innately', Kant accepts, by contrast, that the nature of the capacity for understanding *is* innate to our minds (cf. Kant 1790: 8:221f).

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