The Young Carnap’s Unknown Master
Husserl’s Influence on Der Raum and Der logische Aufbau der Welt

Guillermo E. Rosado Haddock
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The present work offers a more or less complete view of a forbidden chapter in the history of analytic philosophy, namely, the much more than casual influence exerted by Edmund Husserl on the young Rudolf Carnap’s writings. It is a forbidden chapter, since Carnap never acknowledged such an influence, though that influence was overwhelming and decisive, especially in Carnap’s *Der Raum* and *Der logische Aufbau der Welt*. In Carnap’s ‘Autobiography’ in the Schilpp volume Husserl is barely mentioned, and certainly not as a decisive force. More precisely, there are two irrelevant references on pp. 20 and 40, while there is a more important remark on p. 957 in his ‘Reply to Adolf Grünbaum’, though masked by a reference first to Kant. It is not even acknowledged by Carnap that he was Husserl’s student, at least during three semesters in the years 1924–25, as attested in Karl Schuhmann’s *Husserl-Chronik* and in a letter of Ludwig Landgrebe to Husserl. Moreover, there is also the very plausible suspicion that while writing his dissertation, *Der Raum*, between 1919 and 1921 in Buchenbach, a small town on the outskirts of Freiburg, Carnap visited Husserl’s courses or had at least some contact with him. Although there is not any documentary evidence on this point, due to the fact of Husserl’s strong influence on Carnap’s dissertation, it would be extremely strange to believe that during those three years Carnap was never tempted to meet the master. That would be as improbable as a philosophy student writing a dissertation inspired on Quine’s views on the outskirts of Boston in the 1960s, but never succumbing to the temptation of meeting Quine or visiting his courses. Nonetheless, in order to avoid some psychological stress, most Carnapian scholars surely prefer to believe that Carnap was never tempted to visit Husserl’s courses in those days – and some may never even accept, against all evidence, that he later did visit Husserl’s seminars. Incidentally, due to the structure of the German university system and its academic hierarchy, it is immensely more decisive in terms of intellectual and personal contact to take part in seminars – even more so if you are already a doctor or are writing your dissertation – than to visit lectures of some professor, especially, if you are nothing more than a usual student hearing the lectures and merely taking notes. Thus, if Carnap and Carnapian scholars are so eager to baptize Carnap as Frege’s student for visiting three of Frege’s lecture courses, it is by far more justified to call Carnap Husserl’s student. The fact that Carnap never acknowledged it does not detract from his being Husserl’s student. In any case, it could point to some obscure aspects of Carnap’s character, and I am perfectly conscious that the present work will shed some shadows on Carnap’s moral character. Nonetheless, that has never been a motivation for writing this book, but simply to bring light to an unknown and forbidden chapter of the history of analytic philosophy. Together with Husserl and Tarski, Frege and Kant, Carnap has been one of the thinkers who have had the greatest influence on my intellectual development. As in the case of Frege, whose political views were an
aberration, one should clearly distinguish between the theoretical work in science or hard philosophy of a thinker, and the weaknesses or defects of his moral character.

This small book has an extremely long history of maturation. My first contact with some of the themes of this book occurred forty years ago. I was writing my MA thesis on Husserl’s theory of logical grammar, and after reading a paper by Yehoshua Bar-Hillel on the same theme, I read – probably during the summer or early autumn of 1967 – the English expanded version of Carnap’s *Logische Syntax der Sprache*. I immediately noticed the similarity between Husserl’s distinction between the laws that protect against nonsense and those that protect against countersense and govern over derivations, and Carnap’s distinction between formation rules and transformation rules. I was also surprised that there was no mention of Husserl in Carnap’s book on this issue. In the summer of 1967 I also read the English translation of Husserl’s *Cartesianische Meditationen* – though I had already studied German, I still could not read it with proficiency. I became very interested in the problem of intersubjectivity, that is, what Carnap called the problem of the other psyche. My treatment of the problem at the end of Chapter Three dates from 1967, though I have never dared until now to write about it. When I went to Germany in 1968 for my doctoral studies, I had two possible themes for my dissertation, namely, the problem of intersubjectivity in Husserl and Husserl’s philosophy of mathematics. I chose the second one because it would force me to seriously study contemporary logic and some mathematics – and it was the right choice. Around 1970 I read Carnap’s *Der logische Aufbau der Welt* in its German original, and I was impressed by the similarities between his and Husserl’s treatments of the problem of intersubjectivity. Since Carnap’s book was published a year before Husserl’s *Cartesianische Meditationen*, the similarity seemed at first sight to be a pure coincidence. Moreover, my interest in logic and the philosophy of mathematics made me put aside, not only during my five years of studies in Germany (Göttingen and Bonn), but also for some three decades in my native country, Puerto Rico, any consideration of the problem of Carnap’s relationship to Husserl. The publication during the early 1990s of two important papers by Verena Mayer on Husserl’s influence on *Der logische Aufbau der Welt* reawakened my interest in the issue. I completely agree with her analyses and contentions on the Husserl-Carnap relation, though my treatment of that relation is not only more detailed but also more daring. Mayer did not seem to know about Carnap’s philosophical discussions with the young Ludwig Landgrebe in 1924–25, when the latter was Husserl’s assistant. At the end of the 1990s, I decided that I should begin reading *Der Raum*, a work not easy to find. I asked my friend Werner Diederich, then professor at the University of Hamburg, to see if he could find a copy of *Der Raum* somewhere in Germany. Some months later, he found out that Carnap’s dissertation had been reprinted in Liechtenstein by a relatively unknown publisher named ‘Topos Verlag’. He ordered the copy and sent it to me as a gift. The study of *Der Raum* was the clue to the mystery of the similarities. In that small and very interesting book the influence of Husserl is very prominent and undisguised. I then remembered that when I read Karl Schuhmann’s *Husserl-Chronik* some twenty-five years ago, I had read that Carnap had visited Husserl’s courses. I re-read the passage, wrote to Schuhmann, who answered me that he obtained the information from Ludwig Landgrebe. I also wrote to Hans-Rainer Sepp and to the Husserl Archives in Leuwen, and both Sepp and
Sebastian Luft, who was then an assistant at the archives, answered immediately. Prof. Sepp and Dr Luft, as well as Prof. Schuhmann, did their best to help me, though not all my questions could be answered. At the suggestion of Prof. Sepp, I inquired elsewhere, but the main question remains to this day unanswered, namely: had Carnap already met Husserl during the years of 1919–21, while he was writing his dissertation less than a half hour by train from Freiburg?

The first two fruits of my systematic study of the young Carnap’s relation to Husserl are two critical studies in Spanish, different versions of which I have circulated among some scholars. One of the critical studies appeared recently in *Manuscrito*, namely, that of Carnap’s dissertation, while the other, more ambitious one is of a collection of papers edited by Ramón Cirera, Andoni Ibarra and Thomas Mormann under the title *El Programa de Carnap*, just appeared in *Principia*. My critique of Moulines’ interpretation of *Der logische Aufbau der Welt*, as well as some of my criticism of Quine had their origin in that critical study.

Already in the new century some scholars have begun to relate some of Carnap’s views to Husserl’s. The most important of these efforts has been a paper by Sahotra Sarkar on Husserl’s influence on Carnap’s dissertation. Sarkar’s paper is very similar in analyses and conclusion to my recently published critical study of *Der Raum*, though the latter is more thorough and less compromising with Kantianizers of Carnap’s views. In his book *Rudolf Carnap* Thomas Mormann has also related Carnap’s views to Husserl’s, though he is even much more inclined than Sarkar to make concessions to the Kantian interpretation of Carnap’s views. A very recent book by Thomas Ryckman, namely, *The Reign of Relativity*, also mentions briefly the similarities between Carnap’s *Der logische Aufbau der Welt* and Husserl’s writings. Finally, in the also very recent collection of papers *Carnap Brought Home*, edited by Steve Awodey and Carsten Klein, two of the contributors, namely, Jean-Michel Roy and Michael Beaney discuss some aspects of Carnap’s relation to Husserl. Roy’s paper tries to show that the specific relation of Carnap with Husserl under discussion is in the best of cases a superficial one. On the other hand, Beaney points to a specific relation between Carnap’s late use of the word ‘explication’ and Husserl’s notion of explication. However, Beaney is ignorant of the fact that Carnap was Husserl’s student and, moreover, shows his lack of familiarity with Husserl’s two fundamental books, namely, *Logische Untersuchungen* and *Ideen zu einer reinen Phänomenologie und einer phänomenologischen Philosophie I* – which were included in the references both of *Der Raum* and of *Der logische Aufbau der Welt* – and with the fact that Carnap certainly studied those writings in his younger years. Thus, with the exception of Mayer’s two valuable papers and Sarkar’s also important one, there have been only partial and no in depth analyses of Carnap’s relation to Husserl.

I hope that the present book will offer a definitive overview of the extraordinary influence of Husserl on the young Carnap’s views. It is clearly shown in Chapter 1 – which is essentially based on my critical study of *Der Raum* – that Husserl’s influence was by far the most decisive philosophical influence in *Der Raum*. Moreover, and contrary to Sarkar’s and Mormann’s renderings, it is argued that Carnap’s references to Kant, sometimes after referring to Husserl, are mostly cosmetic and seem to have had the purpose of appeasing his neo-Kantian *Doktorvater*, Bruno Bauch, and, in general, the academic powerful neo-Kantian milieu prevailing in many German
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universities at the time. On this point, one should not forget that Bruno Bauch obtained his position as full professor [Ordinarius] at the University of Jena, after the authorities decided, for still unclear reasons, not to hire Husserl, who was by far the first choice of the faculty. Moreover, though Husserl’s views after the transcendental turn were not necessarily in direct conflict with those of neo-Kantians, being also in very friendly terms with Paul Natorp, Husserl dissented from Kant and the neo-Kantians in very important issues, particularly with respect to Kant’s views on the a priori character of Euclidean geometry, a view that Husserl already rejected more than a decade before the advent of Einstein’s theory of special relativity and communicated to Brentano in 1892. Furthermore, at the time in which Carnap wrote his dissertation, Husserl was clearly considered the most important living German philosopher. Thus, Carnap referred freely to Husserl in Der Raum, and an attentive reader can easily see, as Sarkar and Mormann have seen, the decisive influence of Husserl on that book.

A very different issue is that of Carnap’s Der logische Aufbau der Welt. In that book, Carnap refers to Husserl a few times, usually masked among a long list of authors, whose influence on Carnap was much smaller. However, the influence of Husserl in Carnap’s Der logische Aufbau der Welt is immensely greater than Carnap has ever acknowledged. In Chapter 2 of this book I display most of that influence with extensive quotations both from Carnap and Husserl. I complete my discussion of Husserl’s influence on the young Carnap’s extremely ambitious book in Chapter 3, in which I discuss only one issue, namely, the problem of our knowledge of the other psyche, briefly, the problem of intersubjectivity. Once more I show with the help of extensive quotations the overwhelming similarities between Carnap’s and Husserl’s views, and point out that in the years 1924–25, while Carnap was visiting Husserl’s seminars, as attested by Ludwig Landgrebe, Husserl’s assistant during that period – who was then working on the second volume of Ideen zu einer reinen Phänomenologie und einer phänomenologischen Philosophie, subtitled: Phänomenologische Untersuchungen zur Konstitution – Carnap and Landgrebe had extensive philosophical discussions. From Husserl’s two fundamental books, but especially from Husserl’s seminars and from his discussions with Landgrebe, Carnap learned a lot about Husserl’s views, but was particularly reluctant to acknowledge it. Some of the momentary reasons for such a silence could have been the attitudes of his new partners in Vienna, especially Schlick and Neurath. But that does not explain much, since the first died in 1936, and then Carnap moved to the United States, whereas Neurath remained in Europe and died in 1945. In particular, that explanation is totally inadequate to explain Carnap’s silence in his Autobiography. Hence, the reasons for Carnap’s silence are not completely clear.

Chapter 4 is somewhat different from the first three. At the beginning of the chapter, I mention some other issues discussed in Carnap’s later works, in which some possible influence of Husserl is present. The most sure and most outstanding influence is the one I already mentioned above, namely, the distinction between formation rules and transformation rules. Husserl had already made that distinction, using a different terminology, in Logische Untersuchungen – a book included in the bibliography both of Der Raum and Der logische Aufbau der Welt, though, interestingly enough, not in the bibliography of Logische Syntax der Sprache – and
had also discussed the distinction in his 1929 *Formale und transzendentale Logik*, a book that should have at least aroused Carnap’s curiosity. Indeed, in *Logische Syntax der Sprache* there is only one reference to Husserl, on p. 44 of the German 1934 edition, on p. 49 of the English 1937 revised edition, and it is a very marginal one, namely, that Felix Kaufmann distinguished, following Husserl, two sorts of generality. The fact of the matter, however, is that Carnap was acquainted with Husserl’s *Logische Untersuchungen* at least since the time in which he was writing his dissertation, and Husserl’s distinction appears in Chapter XI of the first volume, that is, at the end of the ‘Prolegomena’. There are no excuses for such an omission, nor are there excuses for omitting to mention that the distinction between two sorts of nonsense in ‘Überwindung der Metaphysik durch logische Analyse der Sprache’ was already present in the Fourth Logical Investigation.

But Chapter 4 is not primarily concerned with Husserl’s influence on Carnap. Most of that chapter discusses other issues, especially, the later development of analytic philosophy in the hands of Quine and his followers. It is emphasized that the very important use of logical and mathematical tools in rigorous philosophy is completely independent of its usage as servants of an empiricist philosophy, which in its most radical recent expression, that of Quine, has produced so many questionable theses, and has paved the way for scepticism and post-modernist nonsense. Some of Quine’s fundamental theses and assumptions are submitted to severe criticism, and that is done not as an attack on analytic philosophy but, quite on the contrary, as an attempt to rescue it from the route of self-destruction that Quine and his followers are steering it to. The last chapter, however, is not merely a critique of post-Carnapian analytic philosophy. On the other hand, some new approaches to philosophical problems are interspersed and argued for throughout most of the chapter.

The first draft of this book was written during the academic year of 2004–2005, in which I had a sabbatical from the University of Puerto Rico at Río Piedras, specifically, from November 2004 onwards, since until the beginning of that month I was working on my recently published *A Critical Introduction to the Philosophy of Gottlob Frege*. I returned sporadically to the Frege book until the beginning of 2006 and, thus, in some sense was working on the two books at the same time, even after my sabbatical. In fact, in my first semester after the sabbatical I taught a graduate course on logical empiricism, which helped me to sharpen my ideas and to have an excuse to re-read the first draft of the book.

This time I did not ask anyone to revise my English, and can only hope that it is intelligible enough. As in the case of the book on Frege, though my native tongue is neither German nor English, all translations from German into English are my own. The present book was written in almost complete isolation from other philosophers. As I already pointed out in the Preface to my book on Frege, that is almost inevitable for a professor at the University of Puerto Rico working on such sophisticated philosophical issues. Nonetheless, I have discussed some of the issues of the book with my former students Pedro Manuel Rosario Barbosa and, especially, Carlos Rubén Tirado Negrón. I thank both of them for their patience and friendship. I also thank very especially my friend Werner Diederich for his valuable help of providing me with a copy of *Der Raum*, as well as Thomas Mormann for sending me a pair of interesting unpublished papers and for some technical observations. I
also thank the late Prof. Karl Schuhmann and Profs Sepp and Luft for the valuable information they provided me. Of course, none of them has any responsibility for the daring theses offered in this book.

I hereby thank Open Court for the permission to quote extensively from Rudolf Carnap’s *Der Raum*, and Felix Meiner Verlag for the permission to quote even more extensively from Carnap’s *Der logische Aufbau der Welt*. My thanks also go to Paul Coulan, formerly of Ashgate Publishing Ltd, who was instrumental for having this and my former book on Frege published by Ashgate, and once more to my friend Jan Srzednicki for putting me in touch with Paul Coulan and Ashgate a few years ago. I want also to thank the whole staff of Ashgate Publishing Ltd, who have been so diligent in the different stages of the production of the book. As in my former *A Critical Introduction to the Philosophy of Gottlob Frege* (Ashgate 2006), I have had the pleasure to work with Mrs Anthea Lockley in the correction of my English. Her thorough and careful reading of the book as well as her patience have been of extraordinary help in the final steps of preparation of the definitive manuscript. I most sincerely thank her, as well as Ashgate for having chosen her once more as reader. I should also especially acknowledge my gratitude to Mrs Rachel Lynch, Managing Director of Ashgate, for her continuous support of my project, which included the not easy task of obtaining the permissions for extensively quoting from Carnap’s books.

As in my joint book with Claire O. Hill, *Husserl or Frege?: Meaning, Objectivity and Mathematics* (Open Court 2000, 2003) and my recent *A Critical Introduction to the Philosophy of Gottlob Frege* (Ashgate 2006), I have received technical help from my wife, Dr Tinna Stoyanova, and from our friend and Director of the LABCAD of the University of Puerto Rico at Río Piedras, Dr Joel Donato. Once more, it is a pleasure to publicly acknowledge my debt to them and to thank them for their technical assistance.

My part of my joint book with my friend Claire O. Hill was dedicated to my mother Asia and to the memory of her older sister América, who was for me like a second mother. My more recent book was partially dedicated to my mother on her 100th birthday. I once more partially dedicate this book to her, this time to her memory, since she passed away in July 2007 at the tender age of 102 years. I also dedicate it to the memory of América and of her husband, Rafael, who not only was like a second father to me – I lost my father when I was three years old – but, more importantly, exerted the most decisive influence on me, since I moulded my moral character after him.

Guillermo E. Rosado Haddock
27 October 2007
Chapter 1

Carnap’s First Husserlian Book: 
*Der Raum*

A few decades after the demise of most of the official theses of logical empiricism an interest in the origins of that important philosophical school has arisen among analytic philosophers. Special attention has been given to the writings of the young Moritz Schlick, and even more to those of the young Hans Reichenbach and the young Rudolf Carnap. Particularly, Carnap’s especially important book, *Der logische Aufbau der Welt*, published in 1928, has been the object of intensive discussion and a variety of interpretations among Carnapian scholars. However, very few of those scholars have seen the necessity of examining Carnap’s dissertation, *Der Raum*, in order to better understand the young Carnap’s views and the evolution of his thought. The present author belongs to that small group of scholars who believe that to better understand Carnap’s views in *Der logische Aufbau der Welt*, one has to begin with an assessment of *Der Raum*, a work published in 1922, that is, three years before the completion of the first version of his 1928 book. Thus, this chapter is concerned with Carnap’s dissertation. We will see in an unadulterated state the great influence that Edmund Husserl exerted on the young Carnap.

1 Introduction

According to Carnap’s Intellectual Autobiography in the Schilpp volume, Carnap – who was born in Northern Germany in 1891 – moved with his family to Jena in 1909. From 1910 to 1914 he studied physics, mathematics and philosophy mostly in Jena, though it seems that he did spend – as is very common in Germany – some semesters in another university, in this case in Freiburg in Brisgau. Carnap does not specify when he was a student in the latter university, though Gottfried Gabriel in his introductory paper to *Carnap Brought Home* asserts that it was from 1911 to 1912 and that he attended, among others, courses of the neo-Kantian Heinrich Rickert. In Jena, Carnap’s best-known professors were Bruno Bauch, the neo-Kantian, who was professor of philosophy at that university since 1911, and Gottlob Frege. Carnap attended three of Frege’s lecture courses. He did not take part, however, in any seminar given by Frege. This is very important, and has not been sufficiently stressed by

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3 Paul A. Schilpp (ed.), *The Philosophy of Rudolf Carnap* (La Salle, 1963), p. 3.
Carnapian scholars. In German universities, traditionally a student did not have any contact with a professor offering a usual lecture course. The role of the students was essentially passive, and almost no one dared to interrupt a professor to ask questions. It was only in the seminars where the students got somewhat more acquainted with the professor, and the professor took notice of the existence of the students usually only when the student played an active role in the seminar. Moreover, only students who took part in seminars of a professor were considered to be his students, not those who merely heard lecture courses, but did not have any contact with the professor. Hence, it is not completely correct to assert – as some Carnapian scholars have done – that Carnap was a student of Frege in a strict sense.

The relation that intrigues the present author, however – and has intrigued him for four decades – is that of Carnap with Husserl. Officially, there was no contact between Carnap and Husserl. At least, Carnap seems never to have acknowledged such a contact and, superficially, it seems to be so. During the years 1910 to 1914, Husserl was professor in Göttingen. Although in 1911 the University of Jena had Husserl first in the list of possible candidates to occupy a vacant full professorship at that university, for some still unknown reasons, he did not receive the appointment, and instead it was precisely Bruno Bauch – Carnap’s future ‘Doktorvater’ – who was appointed. Moreover, Husserl received an appointment – as successor of Rickert – at the University of Freiburg in 1916, that is, during wartime, when Carnap was in military service. After the war, however, Carnap lived from 1919 to 1926 – with a few interruptions – in a town named Buchenbach, almost on the outskirts of Freiburg. During those years Husserl was generally regarded as the most important living German philosopher, and, moreover, one with an intellectual background very similar to that of Carnap, having studied mathematics, physics, philosophy and some astronomy. Nonetheless, Carnap seems never to have acknowledged that he had not resisted the temptation of meeting Husserl and taking part in his seminars or hearing his lectures. This selective amnesia is itself a mystery. In fact, there is some evidence that Carnap visited Husserl’s seminars three semesters in a row during the years 1924 to 1925, that is, exactly at the time when the former was finishing the first version of Der logische Aufbau der Welt. In a letter to Husserl, Ludwig Landgrebe – Husserl’s former student and assistant during those years – mentions the fact that he got acquainted with Carnap in one of Husserl’s seminars during those years. But, as we will see, it is in Der Raum, finished in 1921 and published in 1922, where Husserl’s presence seems most explicit or, to put it in

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6 Analytic philosophers tend to ignore the fact that Husserl – like Frege and Whitehead – was a mathematician turned philosopher, who had been a student and assistant of Weierstraß, as well as a student of Kronecker. Moreover, he was a friend of Georg Cantor, and later of Felix Klein and David Hilbert, whose doctoral students during Husserl’s years in Göttingen used to study philosophy with Husserl.


8 See Edmund Husserl, Briefwechsel IV (Dordrecht, 1994), p. 298. See also Karl Schuhmann, Husserl-Chronik, p. 281. On that page, Schuhmann refers to a letter sent to him by Ludwig Landgrebe on 6 August 1976, confirming that Carnap was Husserl’s student during that period.
more exact terms, less censored. It remains an open question for historians of logical empiricism either to establish or to refute the hypothesis that Carnap visited Husserl’s courses or met Husserl personally during the years 1919 to 1921.9 In any case, the probability of Carnap not visiting Husserl during that period would be similar to that of someone writing his dissertation in the outskirts of Boston in the 1960s, referring very often to Quine in that work, but never having visited Quine’s lectures or seminars, or having met him, during that period.

I have had the suspicion of a very strong Husserlian influence on the young Carnap for some forty years. I read the English expanded version of Carnap’s *Logische Syntax der Sprache*10 in the second half of 1967, while I was working on my MA thesis on Husserl’s theory of a purely logical grammar, and was impressed by the similarity between Carnap’s distinction between formation rules and transformation rules and Husserl’s distinction in the first volume of *Logische Untersuchungen*11 and in *Formale und transzendentale Logik*12 between laws that protect against nonsense – the logico-grammatical first layer of logic – and laws that protect against countersense and examine the validity of arguments – that is, the logical or deductive layer. Moreover, I was disturbed by the fact that Carnap does not acknowledge that such a nowadays so familiar distinction is essentially Husserl’s – not Carnap’s, nor Frege’s, Russell’s nor Hilbert’s – and presented to the philosophical public thirty-four years before Carnap’s book. When some three years later I read *Der Logische Aufbau der Welt* – this time in German – I became convinced that the relation of that book with Husserl’s writings was much greater than that of *Logische Syntax der Sprache*. A few years ago I read *Der Raum*, and found Husserl’s influence on Carnap even more evident than in the other two writings. The sufficiently detailed exposition in the present chapter of Carnap’s views in that early neglected work will convince the reader of Husserl’s significant influence on the young Carnap and will make very plausible the suspicion that Carnap had already visited Husserl’s seminars or lectures before he completed his dissertation, that is, during the years 1919 to 1921, when Landgrebe (born in 1901) almost surely was still not a student in Husserl’s seminars and certainly was not Husserl’s assistant.

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9 There is a photograph on p. 294 of Hans-Rainer Sepp’s book *Edmund Husserl und die phänomenologische Bewegung* (Freiburg, second edition, 1988), of the (unidentified) participants in a seminar of Husserl in 1920. Among roughly twenty participants some faces seem familiar, namely, Martin Heidegger and Oskar Becker, at the extreme right, Husserl in the middle, and three places to the left of Husserl a student who looks somewhat like the young Carnap. Indeed, on p. 290 of the same book, there is a photograph of Carnap in 1923. However, in the unclear photograph, taken on an irregular terrain in a mountain, the student who looks like Carnap seems much shorter than Carnap was, and, thus, I am inclined to think that it is not him. That, of course, in no way weakens the suspicion that Carnap already visited Husserl’s seminars or lectures before he completed his dissertation, that is, during the years 1919 to 1921, when Landgrebe (born in 1901) almost surely was still not a student in Husserl’s seminars and certainly was not Husserl’s assistant.


12 *Formale und transzendentale Logik* 1929 (Den Haag, 1974).
2 Introduction to the Study of *Der Raum*

The nineteenth century, especially its second half, and the first two decades of the twentieth century were years of profound revolutionary transformations in the three most fundamental sciences, namely, physics, mathematics and logic. In mathematics, the development of non-Euclidean geometries by Bolyai and Lobatschewsky – already anticipated by Gauß – in the first half of the nineteenth century, and the generalization and transformation of geometrical studies in the second half of that century in the hands of Riemann, Lie and Klein, among others, the emergence of algebraic structures as objects of mathematical research, as well as the rigourization of analysis at the hands of Bolzano and Cauchy in the first half of that century, and its arithmetization at the hands of Weierstraß, Dedekind and Cantor in its second half, transformed our conception of mathematics, a transformation that was consolidated by the emergence of more abstract structures during the twentieth century, including general topology in its first two decades. In logic, the pioneer work of Boole, De Morgan and others in the first half of the nineteenth century was followed by the important contributions of Charles S. Peirce, Ernst Schröder and others in the second half of that century, culminating in the revolutionary contributions to logic of Frege, Peano, Russell and Whitehead. In physics, the development of electromagnetism in the middle of the nineteenth century represented the first great challenge to Newtonian mechanics, whereas the emergence of the special and general theories of relativity, and of quantum mechanics in the first decades of the twentieth century replaced our old Newtonian world with totally new conceptions.

In philosophy, the Kantian foundation of science, which seemed to play the role of a philosophical foundation of Newtonian mechanics and Euclidean geometry, suffered a consequent earthquake, and had either to be abandoned or to be radically repaired, as some neo-Kantians attempted to do. In the same vein as other important philosophers of the first half of the twentieth century well schooled in mathematics and physics – like Bertrand Russell, Moritz Schlick and Hans Reichenbach – Carnap begins his philosophical endeavours with a study of philosophical problems linked to the revolutionary development in our conception of space that occurred in the nineteenth century. However, in contrast to Russell, whose *An Essay on the Foundations of Geometry*\(^\text{a}\) of 1897 precedes the revolution in physics, as well as the development of general topology as an important area of mathematical research, and even some of the new developments in logic to which he would so decisively contribute some years later, Carnap – as well as his friend Reichenbach – had assimilated the development in the three fundamental sciences and was especially prepared and eager to put them to work in philosophical research.\(^\text{b}\) Thus, while in his above-mentioned book Russell contrasts the metric properties of space with the more general projective ones, he almost completely ignores the greater generality of topological spaces, and is not able to adequately assess the epoch-making


\(^\text{b}\) As attested by numerous passages in his *Allgemeine Erkenntnislehre*, English translation, *General Theory of Knowledge* (La Salle, 1985), Schlick had not benefited from the development of logic from Boole to Hilbert.
contributions of Riemann to our understanding of spatial structures. Carnap was perfectly conscious of the relevance of the topological properties of space for its adequate understanding, and since he wrote a few years after the emergence of the general theory of relativity, he was in a better position than Russell to appreciate Riemann’s views on spatial structures and, in general, on manifolds.

As Carnap points out already in the Introduction to his valuable dissertation, his purpose in that small book is to offer an overview of the different sorts of space corresponding to the different meanings of the word ‘space’ in the philosophical and scientific literature. More specifically, Carnap distinguishes three different meanings of the word ‘space’, namely: (i) formal space, (ii) intuitive space, and (iii) physical space. With regard to the first meaning, Carnap tells us that formal space is simply a relational structure, whose members lack of any determination, and about which one only knows that from some connections of a determined kind one can obtain conclusions about connections of another determined kind in the same region. On the other hand, Carnap explains the nature of intuitive space – on pp. 5–6 – as follows:

By intuitive space, on the other hand, is understood the structure of relations between “spatial” figures in the usual sense ... whose determined particularity we apprehend by means of perception or mere representation. One is still not concerned there with spatial facts present in empirical reality, but only with the “essence” of those figures, which can be recognized in any representative of the species. [Der Raum, pp. 5–6]

Any Husserlian scholar would easily recognize in the two quoted sentences of the Introduction to Der Raum three footprints of Husserlian thought. Firstly, one should mention the equivalence for the phenomenological apprehension of essences between perception and mere imaginative representation. Secondly, one should mention the interest for the essences of spatial figures, not for empirical facts. Finally, it should be mentioned that such essences are recognized in any representative of the species.

With regard to physical space Carnap observes that its constituents are empirical spatial facts and, moreover, that our knowledge of physical space presupposes that of intuitive space, which, on the other hand, presupposes that of formal space. This presupposition is clearly not a psychological or empirical one, but one of a logical-epistemological nature, a foundational presupposition. Hence, Carnap will correspondingly examine first formal space, then intuitive space, which is founded

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16 Der Raum, p. 5.
17 Ibid., pp. 5–6.
18 ‘Unter Aschauungsraum dagegen wird das Gefüge der Beziehungen zwischen den im üblichen Sinne “räumlichen” Gebilden verstanden, also den Linien-, Flächen- und Raumstücken, deren bestimmte Eigenheit wir bei Gelegenheit sinnlicher Wahrnehmung oder auch bloßer Vorstellung erfassen. Dabei handelt es sich aber noch nicht um die der Erfahrungswirklichkeit vorliegenden räumlichen Tatsachen, sondern nur um das “Wesen” jener Gebilde selbst, das an irgendwelchen Artvertretern erkannt werden kann.’
19 Ibid.
on formal space, and, finally, physical space, which is founded on the other two kinds of space. With respect to each of the three kinds of space Carnap distinguishes two sorts of subdivision. The first subdivision concerns the number of dimensions, and here Carnap will essentially distinguish two cases, namely, the special case in which the number of dimensions of space is 3, and the general case in which the number of dimensions of space is n, where n is any positive integer. On the other hand, Carnap also distinguishes, in descending order from the more abstract to the more specific, three sorts of levels of spatial abstraction, namely, topological space, projective space, and metric space. Thus, Carnap will consider in Der Raum eighteen different sorts of space, namely, six formal ones, namely, \( R_{3T}, R_{3P}, R_{3M}, R_{nT}, R_{nP}, \) and \( R_{nM} \), six intuitive ones, namely, \( R'_{3T}, R'_{3P}, R'_{3M}, R'_{nT}, R'_{nP}, \) and \( R'_{nM} \), and six physical ones, namely, \( R''_{3T}, R''_{3P}, R''_{3M}, R''_{nT}, R''_{nP}, \) and \( R''_{nM} \).

### 3 Formal Space: Topological, Projective and Metric

In Chapter 1, Carnap considers formal space. According to Carnap,\(^ {20} \) formal space is obtained by means of the tools of the new logic, especially the theory of classes and the theory of relations. In such a fashion ordered series are obtained, and, in particular, continuous series. Formal topological spaces of two or more dimensions can be introduced as continuous series of continuous series — thus, formal topological spaces of three dimensions as continuous series of continuous series of continuous series, that is, as continuous series of third level.\(^ {21} \) The corresponding formal projective spaces are obtained from the formal topological ones by means of particularization. Finally, the corresponding formal metric spaces are obtained from the formal projective ones by further particularizations.\(^ {22} \) Carnap stresses\(^ {23} \) that only in this fashion can one obtain the complete generality required of formal space in order to include all possible subspecies. Thus, a continuous series of the third level — that is, a continuous series of a continuous series of a continuous series — is called by Carnap\(^ {24} \) a formal topological space of three dimensions, in symbols: \( R_{3T} \). More generally, a formal topological space of n dimensions is a continuous series of nth level, in symbols: \( R_{nT} \). In this sort of abstract space, be it of 3 or of n dimensions, it does

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20 Ibid., p. 7.

21 On this point, Carnap seems to have been influenced by Russell’s *Principles of Mathematics* of 1903. This would falsify Roberto Torretti’s assertion in his *Philosophy of Geometry from Riemann to Poincaré* (Reidel, 1977), p. 319, that Russell’s treatment of geometry in that work as the study of series of two or more dimensions had been completely ignored by philosophers and mathematicians. Indeed, in *Der logische Aufbau der Welt* (from now on, briefly: *Aufbau*), p. 149, Carnap once more adheres to this Russellian procedure. Torretti does not mention either *Der Raum* or *Aufbau* in his otherwise valuable and encyclopedic book, probably since Carnap’s writings belong to a later period than the one considered by Torretti.

22 As Thomas Mormann stressed in an electronic communication, Carnap confused projective with affine geometry and, thus, when he speaks about projective geometry the referent is usually affine geometry.

23 *Der Raum*, p. 9.

24 Ibid., pp. 13–14.
not make sense to speak of spatial figures. On the other hand, the particularizations that can be obtained from the formal topological spaces, thus, the formal projective spaces of 3 and n dimensions, and their further particularizations, the formal metric spaces of 3 and n dimensions, can only be justified, stresses Carnap,\textsuperscript{25} if one takes into consideration spatial figures properly. At this level, however, as Carnap puts it on p. 14:\textsuperscript{26} ‘Since here we are still concerned with mere formal relations, without presupposing the sort of objects that are in those relations with each other’. Carnap emphasizes\textsuperscript{27} that the relation between the formal topological space of three and, in general, of n dimensions, and the corresponding formal projective space of three – in symbols: $R_{3P}$ – respectively, of n dimensions – in symbols: $R_{nP}$ – is not the one existing between a species and an individual object belonging to the species, but that between a genus and a species, whereas the formal metric space of three dimensions – in symbols: $R_{3M}$ – respectively of n dimensions – in symbols: $R_{nM}$ – is a subspecies of $R_{3P}$ respectively of $R_{nP}$. Once more, both the terminology and the distinctions made by Carnap remind us, in the philosophical context in which \textit{Der Raum} was written, of Husserl, who very frequently uses this Aristotelian terminology.\textsuperscript{28}

4 Intuitive Space and its Sorts

In Chapter 2 Carnap examines intuitive space, which is concerned not with purely formal relations, but with intuitive spatial figures and relations, thus, as Carnap clearly indicates,\textsuperscript{29} with points, lines, surfaces and spaces, as well as with relations like those of a point being on a line or the intersection of two lines. It should be stressed here that Carnap is not interested in the psychological origin of our representation of intuitive space, but only in the logical foundation of our knowledge of intuitive space, and, especially, in the axioms that serve as logical-formal basis of the remaining statements building up this knowledge. On this point, Carnap refers the reader to Hans Driesch, who had underscored the independence from experience of the axioms of intuitive space by saying that ‘… their knowledge does not become more secure, as is the case of empirical statements, by means of repeating the experience more and more’.\textsuperscript{30} Interestingly, when Carnap tries to explain why the repeated experience does not make such knowledge more secure – in other words, why repeated experience of

\textsuperscript{25} The German text reads: ‘Denn hier haben wir es ja immer noch mit bloß formalen Beziehungen zu tun, ohne daß vorausgesetzt wird, was für Gegenstände in diesen Beziehungen zu einander stehen.’

\textsuperscript{26} Ibid.

\textsuperscript{27} Ibid.

\textsuperscript{28} See, for example, \textit{Ideen zu einer reinen Phänomenologie und einer phänomenologischen Philosophie I} (from now on, briefly \textit{Ideen I} or \textit{II}) (Den Haag, 1950), § 12, pp. 31–3, as well as \textit{Logische Untersuchungen I}, § 63.

\textsuperscript{29} Ibid., p. 22.

\textsuperscript{30} Ibid. The German text reads: ‘… ihre Erkenntnis wird nicht, wie bei Erfahrungssätzen, durch die mehrfach wiederholte Erfahrung immer gesicherter.’