Introduction
Philosophical Essays, Early and Late

The working title of this collection was "Philosophical Essays, Early and Late" – that is, earlier and later than the essays of Hempel's middle period, which are collected in his *Aspects of Scientific Explanation and Other Essays in the Philosophy of Science* [54].* They were published in two decades (roughly, 1945–1965), during which logical empiricism evolved from an arcane neo-Kantian[1] or counter-Kantian sect into something that would seriously be called "The Received View"[2] – a view whose shape and reception owed much to those very essays. They were essays in the sort of logical constructivism that Russell had framed in *Our Knowledge of the External World as a Field for Scientific Method in Philosophy* (1915). Russell's book was the inspiration for Carnap's *Der logische Aufbau der Welt* (1928), and for the *Logische Syntax der Sprache* (1934), which incorporated Carnap's version of "physicalism." In those two decades Hempel could still regard the failings and limitations of that work as mere bumps on the road to logical empiricism. This book of Hempel's essays charts his course into and out of the methods and concerns of that middle period.

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* Bracketed numbers refer to the list of Hempel's publications at the end of this volume.
1 See Michael Friedman, "Overcoming Metaphysics: Carnap and Heidegger," in Ronald N. Giere and Alan W. Richardson, eds., *Origins of Logical Empiricism* (Minneapolis: University of Minnesota Press, 1996), pp. 45–79.
2 See Frederick Suppe, ed., *The Structure of Scientific Theories*, 2nd ed. (Champaign: University of Illinois Press, 1977).

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Having been one of the first logical empiricist graduate students,[3] Hempel would become the last survivor of the Berlin and Vienna circles. Throughout, he was in close intellectual contact with the major figures in the movement – and a movement it was, defined for its activists by no doctrine but by a certain morale and discipline. In his preface to the book that drew Hempel to Vienna, Carnap characterized that morale and discipline as follows[4]:

> Each collaborator contributes only what he can endorse and justify before the whole body of his co-workers. Thus stone will be carefully added to stone and a safe building will be erected at which each following generation can continue to work. . . . We feel all around us the same basic orientation, . . . which demands clarity everywhere, but which realizes that the fabric of life can never be fully comprehended. It makes us pay careful attention to detail and at the same time it makes us recognize the great lines which run through the whole. It is an orientation which acknowledges the bonds that tie people together, but at the same time it strives for free development of the individual. Our work is carried by the faith that this attitude will win the future.

Neurath put it differently; his famous nautical image compared the collaborators to "sailors who must rebuild their ship on the open sea, without ever returning to dry dock and constructing it anew out of the best materials."[5] For Neurath there were no logical building blocks; he saw clumpings (*Ballungen*) where Carnap would have clean-cut stones. In Vienna Hempel felt

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[3] Herbert Feigl was earlier, with Moritz Schlick as *Doktorvater*. His dissertation was *Chance and Law* (Vienna University, 1927).

[4] Rudolf Carnap, *Der logische Aufbau der Welt* (Berlin-Schlachtensee: Weltkreis, 1928; Hamburg: Felix Meiner, 1961); Rolf A. George, trans., *The Logical Structure of the World and Pseudoproblems in Philosophy* (Berkeley: University of California Press, 1967).

[5] Nancy Cartwright et al., *Otto Neurath: Philosophy Between Science and Politics* (Cambridge, UK: Cambridge University Press, 1996), p. 89.

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the pull of both tendencies, but it was Carnap's program of step-by-step construction, offering a chance for serious application of Russell's "Scientific method in philosophy," that inspired the work of his middle period. His later essays record a growing sense of that strategy as a dead end, at least for him – from which the way out might prove to be Neurath's *Gelehrtenbehavioristik*, empirical sociology of science, in something like its Kuhnian atavar.[6]

What was so attractive about the logical empiricist program (ca. 1934), when Hempel began writing these essays? In a word, the answer is *Principia*,[7] – that is, Whitehead and Russell's reduction of mathematics to logic, as seen through the lens of Carnap's 1934 reduction of logic to the syntax of the language of science. These "reductions" were problematical, but perhaps they were no more so than the recent reductions within physics of thermodynamics to statistical mechanics, gravitation to the geometry of space-time, or chemistry to quantum mechanics. The scientific philosophers of the Vienna Circle and the Berlin group hoped to resolve their problems in the scientific spirit just as Russell had urged in 1915 – that is, by careful analytical and constructive work.[8] The resulting aprioristic account of our knowledge of mathematics and logic would be compatible with a strict empiricism concerning factual matters, which lie outside mere syntax.[9] As to the detailed shape of syntax itself, that is ultimately a matter of choice for the scientific community, a matter in which

[6] See Thomas Kuhn, *The Structure of Scientific Revolutions* (Chicago: University of Chicago Press, 1962, 1970). Hempel's middle period writings and lectures provide many examples of his concern for historical and sociological detail in the philosophy of science (e.g., see his *Philosophy of Natural Science* [Englewood Cliffs, NJ: Prentice-Hall, 1966]).

[7] Bertrand Russell and Alfred Whitehead, *Principia Mathematica*, vol. 1 (Cambridge, UK: Cambridge University Press, 1910); 2nd edition (1925).

[8] See Michael Friedman, "Hempel and the Vienna Circle," in James Fetzer, ed., *Science, Explanation and Rationality: Aspects of the Philosophy of Carl G. Hempel* (Oxford, UK: Oxford University Press, forthcoming).

[9] For more about the program, see Ronald N. Giere and Alan W. Richardson, eds., *Origins of Logical Positivism* (Minneapolis: University of Minnesota Press, 1996).

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the question of truth or falsity does not arise. What does arise in
its place is the question of expediency for the purpose of saving
the phenomena.[10]

And now it is time to turn to the "Truth" group of essays.

[10] Rudolf Carnap, *Der logische Syntax der Sprache* (Vienna: Julius Springer, 1934);
Amethe Smeaton, Countess von Zeppelin, trans., *The Logical Syntax of Language*
(London: Kegan Paul, 1937), sec. 82. The translated version was extensively
revised by Olaf Helmer.

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1   [2]* "On the Logical Positivists' Theory of Truth," *Analysis* 2 (1935), 49–59.

2   [6] "Some Remarks on 'Facts' and Propositions," *Analysis* 2 (1935), 93–6.

3   [7] "Some Remarks on Empiricism," *Analysis* 3 (1936), 33–40.

4   [12] "Le problème de la vérité," *Theoria* 3 (1937), 206–46. Translated here by the author as "The Problem of Truth."

5   [107] "The Signification of the Concept of Truth for the Critical Appraisal of Scientific Theories," *Nuova Civiltà delle Macchine* 8 (1990), 109–13. Here, "signification" is a misprint for "significance," which is itself a watering-down of "irrelevance" in the original typescript. This was reprinted under the title "The Significance of the Concept of Truth for the Critical Appraisal of Scientific Theories" (but it was listed in the table of contents as "Evidence and Truth in Scientific Inquiry") in William R. Shea and Antonio Spadafora, eds., *Interpreting the World* (Canton, MA: Science History Publications, 1992), pp. 121–9. Here, I follow the original typescript.

Hempel's defense of Neurath's and Carnap's physicalism in essays 1–3 testifies to the presence of certain "postmodern" themes in logical empiricism (= logical positivism):

A textualist turn to sentences from the facts or reality they are said to report.
A pragmatic turn from truth to apt inclusion in the text as the basic scientific concern.

* The numbers in brackets represent the publication number for each chapter in this list. (See the section entitled "C. G. Hempel's Publications" beginning on p. 305.)

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> A descriptive turn from logic to the empirical sociology of science.

Early (essays 1–4, in Brussels) and late (essay 5, in Princeton), Hempel saw confirmation and acceptance, not truth, as the crucial concept: The methodologically interesting question was how observation reports bring other sentences with them into the text of current knowledge – and how new entries bump old ones. For Hempel, the problem of analyzing the concept of confirmation of sentences by sentences is either the heart of the problem of truth or the successor to that problem. Thus, the early essay 4 replaces the problem of truth with the problem of analyzing the concept of confirmation of sentences by sentences, and the late essay 5 reiterates that theme in a Kuhnian mode.

For the logical empiricists, *Principia Mathematica* was more than an attempt to reduce mathematics to logic. To that bare logical structure they would add empirical primitive symbols, and axioms involving those symbols that would make the system as a whole imply – in addition to the laws of pure mathematics – the laws of physics and, derivatively, all of science. This was the program of physicalism as Carnap saw it in 1934. It posited certain "protocol sentences" (*Protokollsätze*, which can be translated as "basic sentences" or "observation reports") to represent the empirical bases for knowledge. In the early 1930s a debate concerning the form and character of those sentences flared up in the pages of *Erkenntnis* and *Analysis*. Neurath, on the "left wing" of the Vienna Circle, saw protocol sentences – at least in principle – as the sort of thing that scientific observers could write on slips of paper and drop into a bin containing other observers' contributions, so that at any time the pooled contents could serve as the empirical basis of science at that time.[1] Schlick, on the "right," held that scheme to be unworkable in principle no less than in practice. He held that protocol sentences (his *Konstatierungen*) would need to be inseparably associated with observers and occasions in a way that would make them a useless

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[1] The slips of paper in the bin business is my way of telling Neurath's story, not his. (Editor)

jumble of unidentifiable context dependencies once they were mixed into the bin.

Essays 1–3 were young Hempel's contributions to the protocol-sentence debate. In essay 1 he describes it and defends the Neurath–Carnap left wing position. Essays 2 and 3 are further moves in the controversy, rejoinders to replies by Schlick and von Juhos.

In 1955 Hempel had still found it excruciating to recall those essays, which were then twenty years old – perhaps because of the scorn and ridicule Bertrand Russell had heaped upon them fifteen years earlier in Chapter X of *An Inquiry into Meaning and Truth* (1940), as in the following passage:

> . . . To say: "A is an empirical fact" is, according to Neurath and Hempel, to say: "the proposition 'A occurs' is consistent with a certain body of already accepted propositions". In a different culture circle another body of propositions may be accepted; owing to this fact, Neurath is an exile. He remarks himself that practical life soon reduces the ambiguity, and that we are influenced by the opinions of neighbors. In other words, empirical truth can be determined by the police. . . .[2]

Indeed, Hempel and Neurath had muddled the first of two distinctions that Carnap would propound at the Paris *Congrès International de Philosophie Scientifique* in 1935:

1. The question of the definition of *truth* must be clearly distinguished from the question of a criterion of *confirmation*.
2. In connection with confirmation two different operations have to be performed: the formulation of an observation and the confrontation of statements with each other; especially, we must not lose sight of the first operation.[3]

[2] Bertrand Russell, *An Inquiry into Meaning and Truth* (London: Geo. Allen and Unwin, Ltd., 1940), p. 148.

[3] Rudolf Carnap, "Wahrheit und Bewärung," *Actualités Scientifiques et Industrielles* 391 (Paris: Hermann & Cic, 1936), p. 23. The translated version of this essay, "Truth and Confirmation," by Feigl, appears in Herbert Feigl and Wilfrid Sellars, eds., *Readings in Philosophical Analysis* (New York: Appleton-Century-Crofts, 1949), pp. 126–7.

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The second distinction did figure large in Neurath's and Hempel's view – but with a clarity limited by a muddling of the first distinction.

Essay 4 is a bridge both to Hempel's middle period and to essay 8 in the "Probability" group of essays. Here he still seems to be blurring Carnap's first distinction. (A clearer title for essay 4 might have been "The Problem of Confirmation"; and his contrast between absolute and apparent truths in the last paragraph might have been more clearly described as a contrast between sentences that are true and sentences that only seem true.) But the blur has a rhetorical use, for it matches the fog around the traditional philosophical problem of truth, which is the problem he means to dissolve here as a pseudoproblem.

Essay 5, which resonates strongly with contemporary work of Davidson, Rorty, and others,[4] can be read as a dramatic sermon on the text of Carnap's distinction 1 – and a startling corollary of the dissolution announced in essay 4.

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[4] For references, see "Is Truth a Goal of Inquiry? Donald Davidson versus Crispin Wright" – that is, chapter 1 of Rorty's *Truth and Progress* (Cambridge, UK, and New York: Cambridge University Press, 1998).

Chapter 1

On the Logical Positivists' Theory of Truth[1]

This paper has been suggested by a recent discussion between Prof. Schlick and Dr. Neurath, made public in two articles which appeared in volume 4 of *Erkenntnis*,[2] which mainly concerns the positivistic concept of verification and truth.

For the following exposition it may be advantageous to refer to the well-known crude classification which divides the different theories of truth into two main groups – that is, the correspondence theories and the coherence theories of truth. According to the correspondence-theories truth consists of a certain agreement or correspondence between a statement and the so-called facts or reality; while according to the coherence theories truth is a possible property of a whole system of statements (i.e., a certain conformity of statements with each other). In extreme coherence theories truth is even identified with the mutual compatibility of the elements of such a system.

The logical positivists' theory of truth developed step-by-step from a correspondence theory into a restrained coherence theory.

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[1] It has unfortunately been necessary to condense Dr. Hempel's paper slightly. (Editor [i.e., the editor of *Analysis*])

[2] M. Schlick, "Über das Fundament der Erkenntnis," *Erkenntnis* 4 (1934), 79–99. This essay was subsequently translated by Peter Heath as "On the Foundation of Knowledge," and it is reprinted in Henk L. Mulder and Barbara van de Velde-Schlick, eds., *Moritz Schlick: Philosophical Papers*, vol. 2 (Dortrecht: Reidel, 1979), pp. 370–88. See also O. Neurath, "Radikaler Physikalismus und 'wirkliche Welt,'" *Erkenntnis* 4 (1934), 346–62.

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Let us shortly consider the most important logical phases of this process (which do not exactly correspond to the historical ones).

The philosophical ideas, which L. Wittgenstein has developed in his *Tractatus Logico-Philosophicus* and which represent the logical and historical starting point of the Vienna Circle's researches, are obviously characterized by a correspondence-theory of truth.

According to one of Wittgenstein's fundamental theses, a statement is to be called true if the fact or state of affairs expressed by it exists; otherwise the statement is to be called false. Now, in Wittgenstein's theory the facts constituting the world are conceived to consist ultimately of certain kinds of elementary facts which are not further reducible to other ones. They are called atomic facts, and those which are composed of them, molecular facts. In correspondence to these two kinds of facts, two kinds of statements are assumed: atomic statements that express the atomic facts, and molecular statements that express the molecular ones. The logical form in which a molecular statement is constituted by atomic ones reflects the formal structure of facts; and, consequently, just as the existence or nonexistence of a molecular fact is determined by the existence or nonexistence of its atomic constituents, the truth or falsity of a molecular statement is determined by the corresponding properties of the atomic statements. That is to say: each statement is conceived to be a truth-function of the atomic statements.

Wittgenstein's ideas concerning truth were rather generally adopted by the early Vienna Circle. The first to raise doubts, which soon developed into a very energetic opposition, was Dr. Neurath. The first who recognized the importance of Neurath's ideas was Prof. Carnap. He joined some of Neurath's most important theses and gave them a more precise form, and he and Neurath, mutually exciting each other, developed these ideas to the theory of truth which we shall deal with.

A crude, but typical, formulation of Dr. Neurath's main theses may be given as follows.[3]

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[3] See Neurath, (1) "Soziologie im Physikalismus," *Erkenntnis* 2 (1931), 393–431; (2) "Physikalismus," *Scientia* 50 (1931), 297–303; (3) "Sozialbehaviorismus,"