The Philosophy of Rudolf Carnap

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The Philosophy of Rudolf Carnap

based on the intellectual autobiography in *[Carnap63]*

Overview:

A survey of the philosophy of **Rudolf Carnap** using his own breakdown into ten problem areas.

Pseudo Problems in Philosophy
The rejection of metaphysics using the analytic/synthetic dichotomy and the verification principle.

The Foundations of Mathematics
Logicism with added extracts of *Formalism*.

Physicalism and the Unity of Science
Different branches of science are fundamentally parts of a single unified science of physical things (i.e. are reducible to physics).

The Logical Syntax of Language
A purely analytic theory of the structure of linguistic expressions.

Liberalisation of Empiricism
The abandonment of foundationalism and of the principle of verifiability.

Semantics
Carnap broadens his metalingual theory to encompass semantics, with particular concern for the semantic definition of logical truth and the distinction between logical and factual truth.

Language Planning
The *principle of tolerance* leads to linguistic pluralism and to the need for planning how a number of languages can be fitted together yielding a system fulfilling given desiderata.

Probability and Inductive Logic
In order to support his analytic inductive logic Carnap developed a notion of logical or inductive probability.

The Theoretical Language
Carnap considered the correct formal treatment scientific language using the concepts of theoretical physics and the relation of this language to observation language.

Values and Practical Decisions
Notwithstanding his positivist view that value statements lack cognitive content Carnap thought values important. He sought the improvement of the human condition, and advocated socialism and world goverment as ways of eliminating war and poverty.

Pseudo Problems in Philosophy:

> The rejection of metaphysics using the analytic/synthetic dichotomy and the verification principle.

Wittgenstein

The influence of [Ludwig Wittgenstein](#) on Carnap's thought was most significant in relation to this topic of "pseudo-problems". It is therefore of interest to know what Carnap's views were before, during and after the period in Vienna when Wittgenstein exerted his greatest influence.

Early Views

Carnap's early view, when he was writing his *Logischer Aufbau [Carnap28]* involved a "neutral attitude with respect to the language forms used by the various philosophical schools", e.g. between phenomenalistic and realistic language, which later matured into his *principle of tolerance*. At this stage he regarded controversies in traditional metaphysics such as that between realism and idealism as "sterile and useless". He developed this skepticism about metaphysics under the influence of anti-metaphysical scientists (Kirchhoff, Hertz, Mach) and philosophers (Avarenius, Russell and Wittgenstein).

Vienna and Verificationism

Carnap adopts a more radical rejection of metaphysics as, not just useless, but meaningless. He attributes this to the influence of Wittgenstein and attributes to Wittgenstein the demarcation of metaphysics from science using the verification principle, which he describes as the principle that the meaning of a sentence is given by the conditions of its verification and that a sentence is therefore meaningful if and only if it is in principle verifiable. (it is not clear whether Carnap wholly subscribed to this doctrine)

Retrenchment

Carnap later retreated from the characterisation of metaphysics as strictly meaningless, but this seems more a change of vocabulary than a fundamental change of viewpoint. He began to talk of metaphysics as lacking "cognitive content", i.e. that kind of meaning which is relevant to empirical science. Carnap continued to believe "that the thesis of the reality of the external world was an empty addition to the system of science".

The Foundations of Mathematics:

> [Logicism](#) with added extracts of [Formalism](#) (and a small measure of sympathy for [Intuitionism](#)).

Carnap was a wholehearted Logicist who nevertheless found some merit in the other principle attitudes to foundations in his time.

Logicism

Carnap's logicism derived initially and primarily from Frege, though he also studied *Principia Mathematica*, preferring its notation and building on its theory of relations. He accepted Frege's view that mathematics is analytic (and also the mathematical study of geometry), and seemed to regard this as providing an important *new* way for empiricists to give a satisfactory account of mathematics (*pace* Hume). Carnap recognised the difficulty in showing that the axioms of Principia were logical. He preferred to argue that the axiom of infinity is indeed analytic (via a suitable interpretation) but if that failed he would regard mathematical truths as conditional (and hence still analytic) rather than synthetic (and hence empirical, in default of pure intuition).

Formalism

Until about 1935 Carnap's work and his publications were very syntactic in character, as is conspicuous in *[Carnap35]* and he appeared to believe (*pace* Gödel) that syntax sufficed. At this time however he and Tarski were beginning to attach importance to semantics, and this marks a break with formalism (admittedly after its central goal was long dead). Carnap was then out of sympathy with the anti-semantic aspect of formalism, and apparently also with their acceptance of pure intution. He accepted from Tarksi the need for formalised metalanguage distinct from the object language.

Intuitionism

Carnap (& the circle) studied intuitionism but remained opposed to the view that mathematics derives from pure intuition (which Carnap also attributes to Hilbert and other formalists). In some of his work on logical syntax he used constructive languages, but his principle of tolerance made this innocuous, and his reservations about classical logics primarily concerned risk of inconsistency.

Geometry

In Carnap's doctoral dissertation (*Der Raum*, 1921) he identified three different problems in the study of space, the study of formal space, intuitive space and of physical space. Of these knowledge of formal space is logical in character, that of intuitive space is philosophical and is based on Kantian pure intuition, while knowledge of physical space is entirely empirical. He then jetisoned the metaphysics, coming into agreement with Schlick, who, with Einstein's agreement had propounded in 1917 the view that mathematical geometry was properly a part of mathematics and to be distinguished from the empirical question which arises once a physical interpretation of geometry has been established.

Physicalism and the Unity of Science:

Different branches of science are fundamentally parts of a single unified science of physical things (i.e. are reducible to physics).

Phenomenalism v. Physicalism

Though Carnap held the theses of materialism and idealism meaningless, he believed that the choice between phenomenalistic and physicalistic languages significant. In his *Logischer Aufbau [Carnap28]* Carnap advocated a phenomenalistic language (talking about sensory experience), believing this to be appropriate for philosophical purposes, and particularly with a concern for a foundationalist epistemology in which our knowledge of material things is derived from certain knowledge of immediately given sense-data. During his period in Vienna Carnap gradually shifted to a preference for physicalistic languages (talking about physical objects).

The Unity of Science

Carnap believed that all branches of science are *fundamentally* part of one comprehensive unified science. This view was a reaction against the doctrine popular in Germany at that time that science was fundamentally split into two kinds, the natural and the "spiritual sciences" (covering social sciences and humanities), and in this light may be thought allied to the rejection of metaphysics and the verification principle. Unity was connected with physicalism through the thesis that "the total language covering all science can be constructed on a physicalistic basis".

Physicalism and Psychology

The greatest challenge, both to physicalistic language and to the Unity thesis was thought to be psychology. Carnap says that he had been misunderstood as claiming that statements about other minds are meaningless, whereas what he said was that *if* the physicalistic interpretation of statements about other minds is rejected *then* they become meaningless. As his empiricism was liberalised by the dilution of the verification principle, Carnap attempted to make his treatment of other minds more credible by shifting from an assertion of the *definability* of psychological concepts in terms of physical ones to one of *reducibility*. [1938]

The Logical Syntax of Language:

> A purely analytic theory of the structure of linguistic expressions.

Context and Influences

Russell

Since reading *Our knowledge of the external world* in 1921 Carnap had felt at one with Russell on the logico-analytic method of philosophy. Carnap's work on logical syntax was part of his development of those ideas, the central theme of which was the exploitation of modern logical methods in making philosophy into a scientific discipline (but *not* an *empirical* science).

Hilbert

The character of the work, as well as Carnap's own testimony show the influence of Hilbert's programme of metamathematics, so that this work might best be thought of as rigorous metaphilosophy. Hilbert's influence is perhaps most marked in the confidence which Carnap shows in the sufficiency of formal axiomatic techniques without the need for concessions to any less precise way of pinning down the *meaning*.

Wittgenstein

It may be noted that Carnap was wittingly repudiating Wittgenstein's tractarian doctrine that talk about the workings of language is impossible.

Gödel

Carnap's confidence in the adequacy formal syntax might be thought to betray an ignorance of Gödel's incompleteness results. To the contrary, Carnap was in fact greatly influenced by the method's which Gödel used in his proof. Carnap using the same language as metalanguage and object language, as is made feasible by Gödel's techniques for arithmetic encoding of syntax, and shows his awareness of those limitations of formal techniques which flow from Gödel's incompletness result.

Tarski

Throughout the period when Carnap developed his syntactical methods he was in close contact with Tarski, while they both became increasingly convinced of the importance of semantics. The result of this dialogue with Tarski, though concurrent with writings on logical syntax, do not appear at this stage, but in Carnap's later semantic work, in which he shifts to using a metalanguage distinct from the object language (as is appropriate for semantics though unnecessary for syntax).

Publications

1934 – Logische Syntax der Sprache
The culmination of Carnap's work on "logical syntax" *[Carnap34]*.

1935 – Philosophy and Logical Syntax
In 1934 Carnap gave three lectures in London. The transcript (*[Carnap35]*) provides a concise overview of his work on Logical Syntax.

1937 – Logical Syntax of Language
The English translation of by Amethe Smeaton *[Carnap37]*. This also includes extra material which had been omitted from the german edition.

Liberalisation of Empiricism:

The abandonment of foundationalism and of the principle of verifiability.

At the time of the *Logischer Aufbau* Carnap supposed all empirical knowledge decidably derived with certainty from the indubitable immediately given. In addition the principle of verifiability asserted that all meaningful sentences were in principle susceptible of definite verification or refutation.

This position Carnap perceived to be in conflict with other important principles which he accepted. These included an emphasis on the hypothetical character of laws of nature. Other aspects also, for example the indubitability of the immediately given, came to be doubted, under the influence of Neurath and Popper. The "Left Wing" of the Circle (Carnap, Hahn, Neurath), doubting the verification principle, sought a better criterion of significance. This took place over an extended period during the 30s.

This resulted in Carnap abandoning the verification principle and accepting as significant sentences which are "confirmable", i.e. if observation sentences can contribute either positively or negatively to its confirmation. He also abandoned the requirement that the concepts of science be explicitly definable in terms of observation concepts (in a physicalistic language), "more indirect methods of reduction could be used". Similar liberalisations were also desirable for phenomenalistic accounts.

Semantics:

Carnap broadens his metalingual theory to encompass semantics, with particular concern for the semantic definition of logical truth and the distinction between logical and factual truth.

First Steps

Carnap was acquainted with the ideas of Tarski on semantics, encouraged Tarski to present them at the "International Congress for Scientific Philosophy" in 1935, and in his own contribution to that congress emphasised the importance of semantics, which proved controversial and aroused much opposition among philosophers at that time. At this time Carnap's own published work was highly syntactic in character reflecting the formalist ideas of Hilbert that formal syntax sufficed. Henceforth Carnap began intensive work on semantics and published several books partly or wholly on that topic.

Semantics and Modality

From 1941 Carnap connected his work on semantics and modal logic in the following way. Modal properties of propositions corresponded to semantic properties of sentences which express the propositions. Thus a necessary proposition is one expressed by sentences which are logically true. Working both on modal logic and semantics at the same time he studies modal logics with variables and a semantic method called the method of intension and extension based on Frege's distinction between *sinn* and *bedeutung*.

Logical Truth

Carnap was particularly interested in the distinction between logical and factual truth and constructed a semantic definition of logical truth (which he identified with analyticity). This marks a break with his earlier definitions of L-truth as a syntactic concept. In this he was opposed by both Quine and Tarski who both denied that the distinction could be made precise and considered it a matter of degree. In this enterprise Carnap was guided both by Leibniz's conception of necessity in terms of possible worlds and Wittgenstein's characterisation of logical truth as tautological.

This distinction was fundamental to Carnap partly because it enables a satisfactory empiricist account of the status of mathematics, but also because of the role it plays in distinguishing philosophy from the empirical sciences. Carnap's views on these matters were controversial at the time and have remained so.

Abstract Entities

A particular source of opposition to Carnap's semantic methods arises from the use of abstract entities such as classes, properties, and numbers, many philosphers feeling that such use depends upon demonstration that these abstract entities "do actually exist". Carnap regarded such questions as metaphysical and hence senseless, but they were raised by anti-metaphysical empiricists.

Carnap's paper "Empiricism, Semantics and Ontology" (*[Carnap50]*
) describes his position in repect of abstract objects. It introduces the distinction between internal and external ontological questions.

Publications

1939 – Foundations of Logic and Mathematics
This was Carnap's first publication (an encyclopedia monograph) addressing semantics in which he explains the difference between syntax and semantics and describes the role of semantics in the methodology of science *[Carnap39]*.

1942 – Introduction to Semantics
Covers the theory of truth, logical implication and logical truth.
[Carnap42]

1943 – Formalisation of Logic
[Carnap43].

1947 – Meaning and Necessity
The method of extension and intension, L-determinacy, the method of the name relation, metalanguages for semantics, the logic of modalities. Supplements include "Empiricism, Semantics and Ontology". *[Carnap47]*
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1963 – The Philosophy of Rudolf Carnap
This volume contains an account of Carnap's view on semantics in III §10. *[Carnap63]* .

Language Planning:

> The principle of tolerance leads to linguistic pluralism and to the need for planning how a number of languages can be fitted together yielding a system fulfilling given desiderata. Carnap, like Leibniz before him, was interested both in the construction of formal languages and in that of devising a new international informal language. These two problems suggested to him "utterly different" methods of solution.

Formal Languages

Carnap was aware of the great diversity of distinct formal languages and was interested in the problem of finding languages suitable for particular purposes. This lead to his "principle of tolerance", and to the recognition of the problem of "planning" languages.

This is the problem of planning a "language system" in which various distinct languages are used as appropriate so that their use fits together coherently in solving some overall problem.

Only slowly did Carnap (on his own account) come to appreciate the great gulf which opened up, concerning the use of formal languages, between, on the one hand, the Vienna Circle and many philosophers in the USA, and on the other, those philosophers who were cheifly influenced by Moore and Wittgenstein.

[There is really nothing of substance

Informal Languages

Carnap became interested in this problem at the age of 14 on discovering a pamphlet on Esperanto, which he then learned, and became fluent in.

Later he became interested in the more theoretical side of designing such languages, and studied a wider range including *Ido*, *Latine sine flexione*, *Occidental* and *Interlingua*.

Carnap applied his principle of tolerance to these as well as to formal languages, and tried to calm the controversies which raged between proponents of the various languages.

in the Schilpp volume on this aspect of Carnap's philosophy]

Probability and Inductive Logic:

In order to support his analytic inductive logic Carnap developed a notion of logical or inductive probability.

Carnap's work on probability and inductive logic were connected with the liberalisation of empiricism as a part of which he abandoned the verification principle. The idea was to replace the black-and-white notion of verifiability with the more subtle tones of confirmability. Carnap sought a notion of probability suitable for this purpose, the frequency notion of probability not being thought suitable. This new kind of probability he called logical or inductive probability, and is used in giving an exact numerical value for the degree of confirmation which bodies of evidence confer upon scientific hypotheses. "Inductive logic", by which Carnap means any system of inference in which conclusions do not hold with deductive necessity, is essentially the rules whereby these logical or inductive probabilities are assigned to conclusions.

The Theoretical Language:

Carnap considered the correct formal treatment scientific language using the concepts of theoretical physics and the relation of this language to observation language.

Theoretical Concepts

The theoretical language is the closest of Carnap's languages to the language of theoretical physics, and makes use of concepts which do not refer to anything directly observable. He conceived of the system of science or of some particular field of science as a calculus whose axioms corresponded to the fundamental laws of the field. On this basis further concepts are defined eventually leading to concepts closely related to observable properties. These concepts are then connected by semantic rules to observables,

This provides a connection between the fundamental concepts and observables which does not amount to defining the concepts in terms of observables, but which is sufficient for an understanding of the theoretical terms.

Nominalism and Finitism

It seems that even in relation to the theoretical language Carnap was much preoccupied with the relation between the theoretical concepts and observations.

Later (1940-41), in discussions with Tarski and Quine, also Nelson Goodman, the question of the what nature the observation language would have to have to be completely intelligible was considered, and the conclusion reached that it would have to be nominalistic, referring to no abstract entities. It was also agreed that the basic language should be finitistic and constructivist. (some material on this topic was published later by Quine and Goodman)

Values and Practical Decisions:

Notwithstanding his positivist view that value statements lack cognitive content Carnap thought values important. He sought the improvement of the human condition, and advocated socialism and world goverment as ways of eliminating war and poverty.

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