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The Other Logic.
The Historical Background
for a “Paradigm Shift” in
Logic

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Overview

- Deduction: **Carnap's „Logical Syntax“**
- Induction: **Carnap's logical probability**
- Kant's transcendental logic and Hegel's logic
- Structure¹ and structure²
- Husserl: „Zu den Sachen selbst“
- **Carnap's „Aufbau“ as a logic of concepts**
- Heidegger's “productive logic”
- Conclusion

Deduction: Carnap's „Logical Syntax“

- Logical Empiricism is based on the so-called hypothetical-deductive method
- There is a formalized *physicalistic* language with purely logical L-rules (mathematics, logics) and some empirical P-rules (physics, empirical sciences)
- We can prove mathematical and logical theorems and we can derive empirical forecasts and confront them with reality

Induction: Carnap's logical probability

- Reichenbach's frequentist approach to induction failed (Goodman's „new riddle“, etc.)
- Carnap's approach to induction is logical probability: $c(h,e) \in [0,1]$ is the degree to which evidence e supports hypothesis h
- There are uncountably many possible c -functions
- The approach can deal with Goodman's riddle and other puzzles but there is an irreducible normative (subjective) factor

Induction versus concept formation

- Science (and every kind of “reasoning”) is based on deductive logic, inductive *rules* are important but not as essential
- Nevertheless there *is a second question* in science that is no less important than deduction
- This is *not* the question of *induction* but the question of *concept formation*
- Kant’s solution of “Hume’s Problem” is not based on a theory of induction but of concept formation

Kant's transcendental logic

- Pure logic (i.e. deductive logic) needs a transcendental foundation
- The categories are the basic concepts of pure logic (forms of judgements)
- Transcendental logic explicates those basic concepts
- Transcendental logic provides a “deduction” of those pure concepts („transcendental deduction“)

Hegel's logic as a logic of concepts

- Unlike Kant's transcendental logic Hegel's logic provides an explication not only of some crucial concepts of pure logic and metaphysics but of *every concept*
- Hegel's logic describes the conceptual system of science which is formally organized as a tree of concepts
- Thus Hegel's logic is not a logic of *propositions* (and not a "paraconsistent" logic) but a logic of *concepts*

The third perspective: Intension, Extension, Structure

- In Leibniz' logic of concepts (like in any other *analytic* logic of concepts) there are two perspectives of concepts: intension (i.e. properties) and extension (i.e. objects)
- The basis of Hegel's logic of concepts, however, is a third perspective: *structure*
- Neither properties nor objects in Leibniz' sense do have structure

Structure¹ and structure²

- Structure¹: structure is a class of relations, a graph or „Pfeilstruktur“ (structure of arrows)
- Structure²: structure is totally non-formal. Relations are unable to represent *directly* this irreducible aspect of structure
- This is the core of the difference between „continental“ and analytic philosophy

Husserl: „Zu den Sachen selbst“

- Hegel's logic fails because of its *formalistic* layout
- Concept formation can impossibly be a purely *formal* business (cf. *characteristica universalis*)
- Husserl: the formation of concepts must take place *directly*, in the sense of a material (and, yes, empirical) event
- Husserl's “εποχη” is the act of *concept formation*

Carnap's „Aufbau“ as a logic of concepts

- The basic entities (atoms) of the „constitutional system“ of the “Aufbau” are Husserl's “Sachen selbst”
- The “Aufbau” is the first approach in the history of philosophy to a logic of concepts that combines the materialistic approach (Hegel, Husserl) with formal-deductive logic
- Unfortunately Carnap banish structure² from his system in considering only *relations* of atoms and not the atoms in itself (“Quasi-Analyse”)
- Thus the “Aufbau” ultimately fails to provide a materialistic logic

Heidegger's „productive logic“

- Husserl's “εποχη” provides a too simple picture of concept formation
- The empirical process of concept formation must be reconstructed in a background theory – *fundamental ontology*
- Heidegger's productive logic is non-formal, purely empirical: it is *pure materialistic logic*, logic of structure²

Conclusion

- The other logic = Carnap + Heidegger
- *Mind* is the only place where structure² exists – structure² *is transcendental and not formal*
- Logic is: formal-deductive logic plus transcendental psychology
- This *is psychologism* of a sort
- *That* kind of logic will also replace “inductive logic”

structure²

structure¹

absolutely
empirical

formal
and
empirical

absolutely
formal



Heidegger's productive logic

Husserl's phenomenology

Hegel's logic

The other logic

Carnap's „Aufbau“

Carnap's inductive logic

Carnap's „Logical Syntax“