

Quantum Mechanics in Heidegger's Thought about Science

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Quantum Physics (HQ-3)
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Cathryn Carson
University of California, Berkeley
clcarson@berkeley.edu

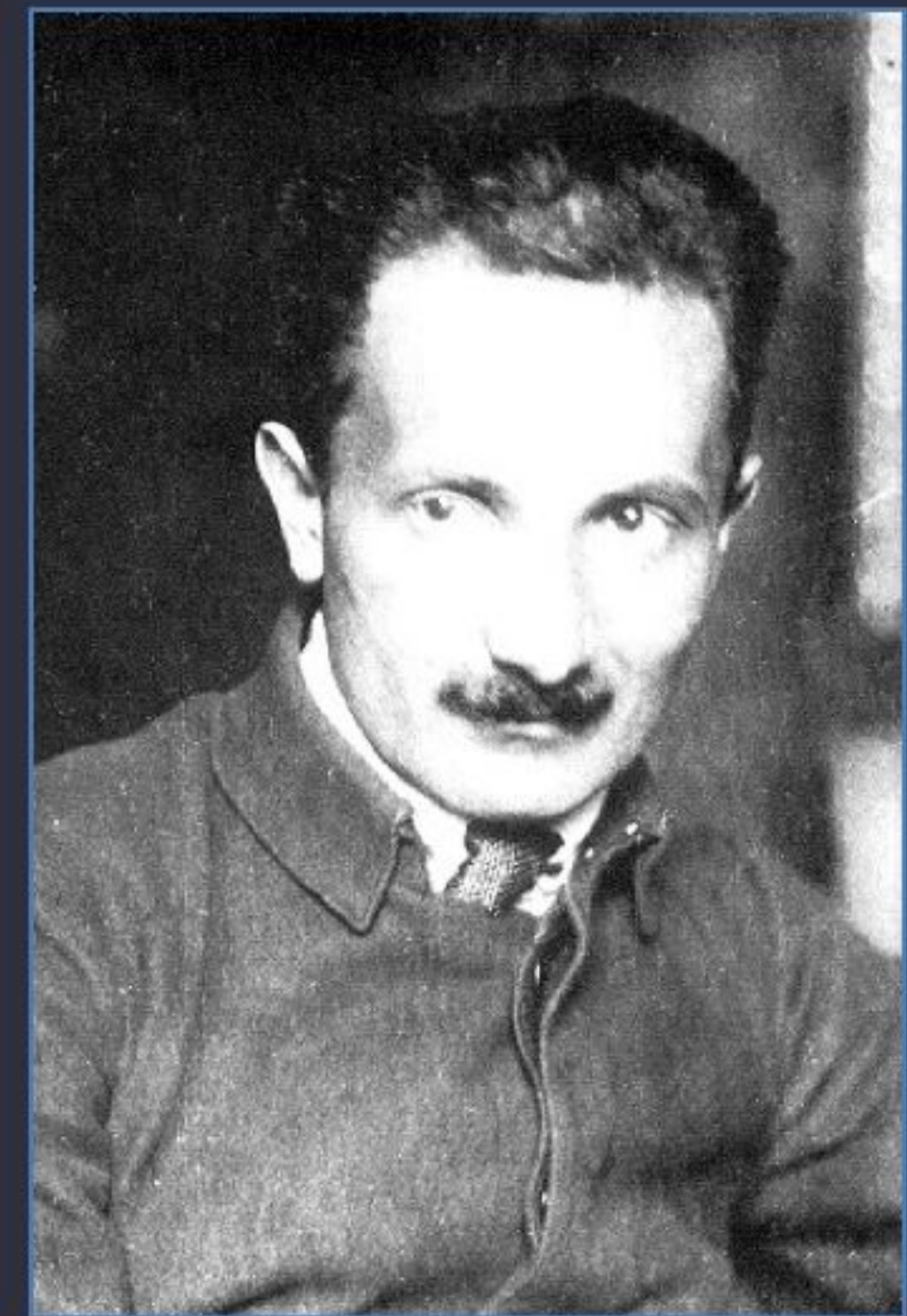
Heidegger as student – “cand. math.”

Courses 1911-1913, including

- Analytische Geometrie des Raumes, 1st.
- Anorganische Experimentalchemie, 5st.
- Integralrechnung, 4st.
- Höhere Algebra, 4st.
- Theorie der Differentialgleichungen, 4st.
- Experimentalphysik, 5st.

Mathematics as a Nebenfach in the
Rigorosum (examiner: Lothar Heffter)

The young
Martin
Heidegger



Philosophical training and early positioning

Starting point: Aristotelian and medieval philosophy

Neo-Kantianism
(Rickert, Lask)

Phenomenology
(Husserl)

Lebensphilosophie
(Dilthey)

Die Lehre vom Urteil im Psychologismus. Ein kritisch-positiver Beitrag zur Logik

Dissertation (Arthur Schneider, Doktorvater), 1913

Die Kategorien- und Bedeutungslehre des Duns Scotus

Habilitation (Heinrich Rickert, Direktor), 1915

Sein und Zeit, 1927

Heidegger and physics: delimiting the territory

What are we working from?

Mostly prefatory remarks in teaching contexts – lecture courses, especially (often on not-so-obviously-related subjects)

What's the temporal development?

Time / temporality



Human freedom / determinism / causality



Subject-object and security of knowledge

What's the larger transition?

Some original openness to the possibility that the sciences can think philosophically.

Context: *Grundlagenkrise*.



Increasingly radical critique of *Wissenschaft*.

Claim: Shift is partly provoked by watching the sciences, especially theoretical physics.

Relativity

Der Zeitbegriff in der Geschichtswissenschaft (Habil.-Vortrag, 1915)

Special relativity as basis for the contemporary physical concept of time

The Dilthey lectures (Wilhelm Diltheys Forschungsarbeit ..., 1925)

“That time is really local time makes sense when one considers that the self is actual time, that it is not something that happens outside of us, a container of being, but we ourselves ... Kant, too, determined time from the apprehension of nature. Now we have to understand time as the reality of ourselves.”

Logik. Die Frage nach der Wahrheit (lecture course, WS 1925-26)

“[T]he jolt in which a science moves forward always lies in the revision of its fundamental concepts, that is, in the shifting that sets in of its existing propositions and stock of concepts onto new foundations. The upheaval in contemporary physics by Einstein was carried out in this way—not because he started philosophizing about the foundations of physics, but because he went after the fundamental concepts and framing that were involved in particular concrete problems and saw that revision of those concepts was necessary, were the goal of physics to be retained at all.”

The *Grundlagenkrisis* (mid-1920s)

Crisis – Not just in philosophy

- In physics: Relativity (special and some general)
- In mathematics: Formalism vs. intuitionism
- In biology: Thinking of the organism > physico-chemical reductionism and mechanism

Why is this promising?

In crisis the sciences are seeking out
“an original relation *zu den Sachen selbst*”

(*Prolegomena zur Geschichte des Zeitbegriffs*, summer semester 1925)

Quantum mechanics

New crisis in physics:
“the concept of causality, of cause and causation”
(first appears around winter semester 1928-29)

Significance:

The nature of causation is a good Kantian (and neo-Kantian) question.

- In relation to time sequence and temporality
- In relation to human freedom

(lectures of summer semester 1930: Vom Wesen der menschlichen Freiheit)

Quantum mechanics

New crisis in physics:
“the concept of causality, of cause and causation”
(first appears around winter semester 1928-29)



Jordan – doesn't
know Kant



Gerlach – even
worse



and
Heisenberg?

Heidegger on Heisenberg (1): appropriation

(later: Die Frage nach der Technik, 1953)

For now, the 1930s:

- Discussion in Todtnauberg with Viktor von Weizsäcker
- “the leading minds of atomic physics today, Niels Bohr and Heisenberg, think philosophically through and through”

(Die Frage nach dem Ding. Zu Kants Lehre von den transzendenten Grundsätzen, winter semester 1935-36)

Why??

Short version:

Because Heisenberg isn't talking about causality (anymore)

Long version:

Because he's talking about other things that sound more promising

What's on Heidegger's mind around 1937-38?

Key themes

- Subjects and objects – their constitution and relation
- Security of knowledge – what the modern subject demands

Key terms

- das Mathematische
- Gegenstand / Vergenständlichung
- Weltbild

Key figures

- Kant
- Descartes
- Nietzsche

Key texts

- Die Zeit des Weltbildes (1938, published later)
- Die Bedrohung der Wissenschaft (lecture notes, 1937)

Heidegger on Heisenberg (2): reversal

Heisenberg thinks he's escaped Cartesian thinking— but he hasn't:

Measuring instrument influencing the phenomenon? Misformulated.

Toying with subjects and objects is a mistake; the two arise together, *in relation*.

[E]verything remains in the same plane, letting the one [quantum physics] encroach on the other [classical physics] or coupling them together and recognizing a cut [*Schnitt*] in between. But the question of what kind of objectivity [*Gegenständlichkeit*] corresponds to the statistical way of representation [*Vorstellungsweise*] and how this is to be brought together with the classical one, the question whether a fundamental reflection is needed on the *truth* of the classical projection [*Entwurf*] and its thrownness [*Geworfenheit*], which is slowly becoming manifest, remains unasked.

Leitgedanken zur Entstehung der Metaphysik, der neuzeitlichen Wissenschaft und der modernen Technik (assorted lecture notes from the later 1930s and early '40s)

Heidegger and physics: thinking with Heisenberg

From the best hope for a science that thinks philosophically ...
To the exemplar of all that makes that impossible.

Recap:

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development?

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determinism / causality



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