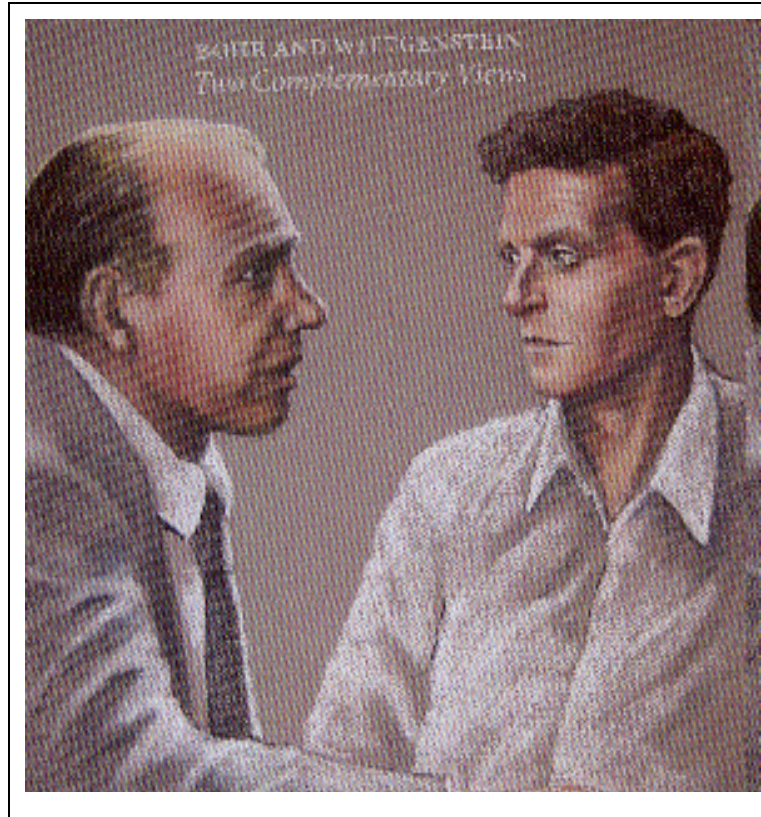


The Search for Certainty

Niels Bohr

1885-1962

Copenhagen



L. Wittgenstein

1889-1951

Vienna

Björn Kurtén 1984

- There are two roads to knowledge; they have been called the external and the internal road. On the external one, we learn how the world around us is constituted. The internal road teaches us how we, through introspection, learn to know the internal life of our own, which also implicates intuitive understanding of our fellow humans, of art, ethics and religion. We have to walk both.

The hunting ground of formal arguments

- What counts as an adequate test belongs to logic.
- It belongs to the description of the language game.
- The truth of empirical propositions belongs to the frame of reference.

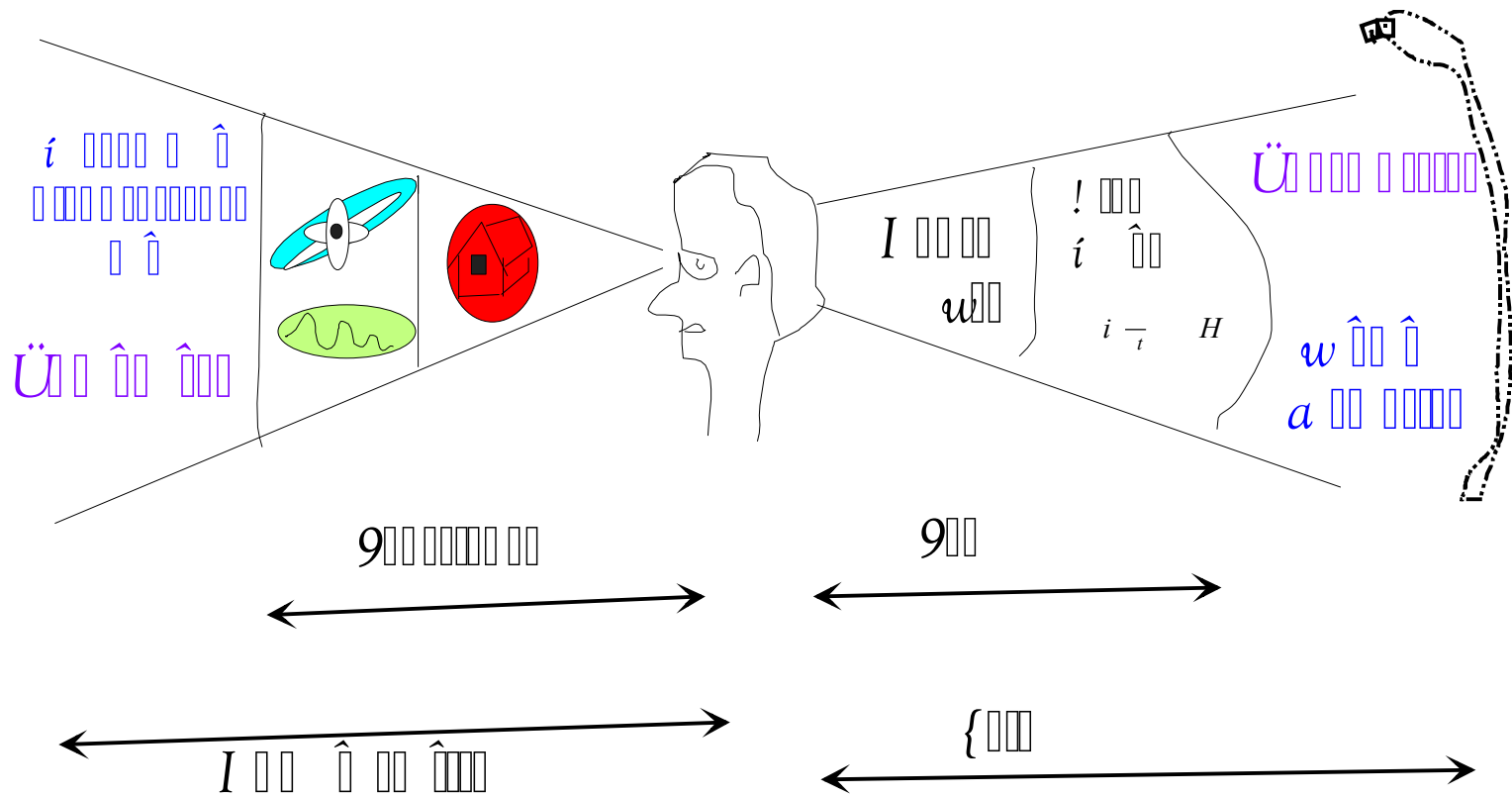
- Wittgenstein

- All testing, all confirmation and disconfirmation takes place within a system.
- The system is not so much a point of departure as the element where the arguments have their life.

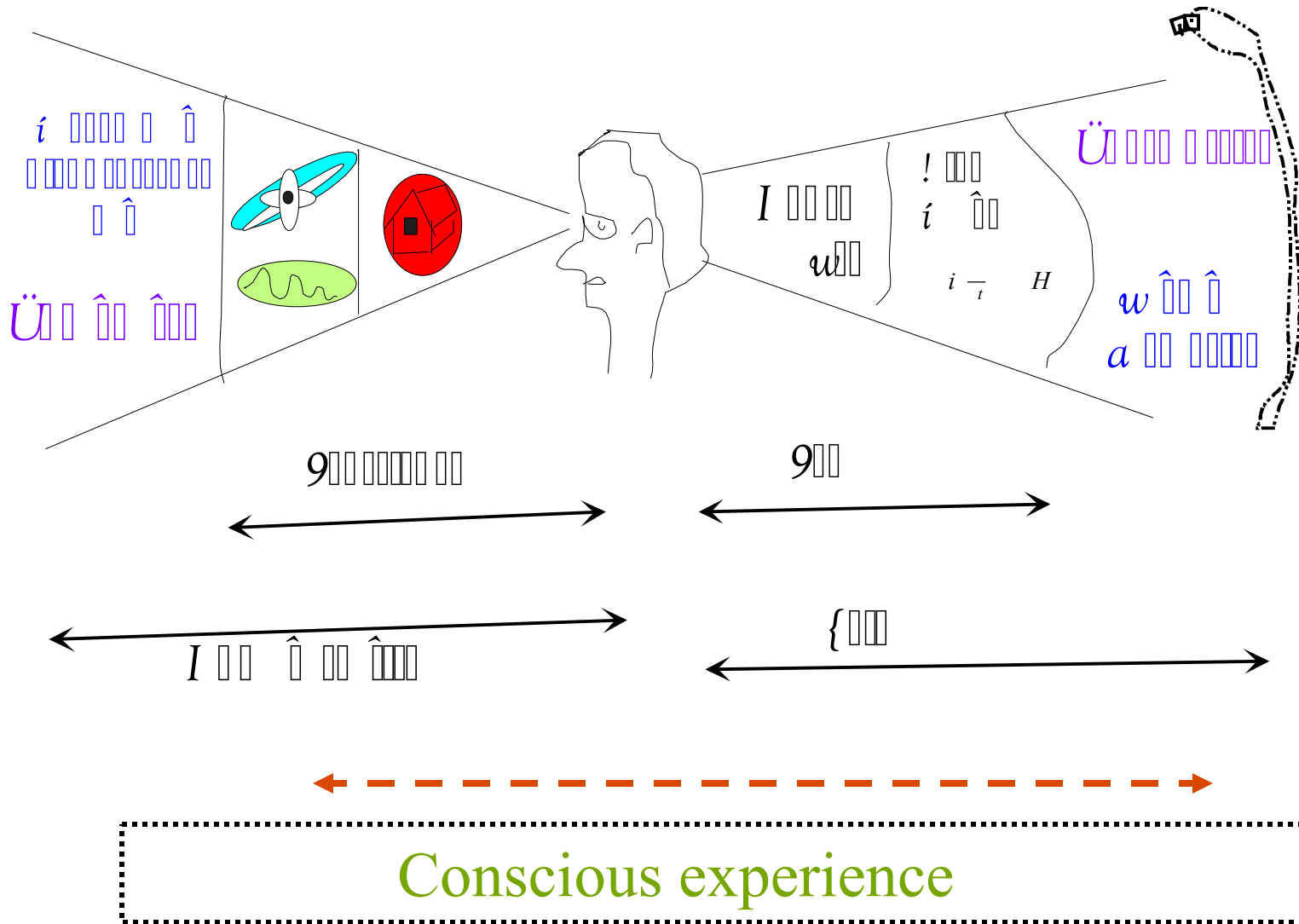
- von Wright

Search for Certainty

1. Conscious knowledge
2. Safe knowledge
3. The environment
4. Inherited influences
5. Sources
6. Comparison Bohr-Wittgenstein
7. Conclusion



The metaphysical observer



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1900 – A safe world

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Lord Kelvin: Two clouds
on the physics sky.

- Black body radiation
- Velocity of light



- Quantum theory
- Relativity

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- Quantum theory
- Relativity

- Frege , Russel et alii:
Derive Mathematics



- Paradoxes of Set theory
- Gödel incompleteness
- Limits of formalism

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Past glories

- Denmark lost the war against Napoleon
- The bank failed in 1813
- Norway given up in 1814
- Schleswig- Holstein lost in 1864
- The Habsburg double monarchy was an anachronism
- The stock failed in 1873
- World War I broke up the Empire

Important cultural manifestations

Copenhagen

Religion liberalized by
Grundtvig †1872

Prolific author

Kierkegaard 1813-1855

Contacts to philosophy:

- Møller
- Høffding
- W. James

Vienna

Habsburg's Empire:

- Architecture (Loos)
- Literature (Musil, Schnitzler)
- Art (Kokoschka, Klimt)
- Musik (Strauss, Schönberg, Lehár)
- Psychology (Freud)

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Background knowledge

Bohr

Contacts to philosophy:

- Kierkegaard
1813-1855
- Høffding
- Neurat
- Frank
- James

Wittgenstein

- Philosophy of physics:
- Hertz
- Mach
- Boltzmann
- James

Comments

- Kierkegaard became one originator behind *existentialism*.
- It is not clear what Bohr and Wittgenstein had read.
- Hegel dominated much of the philosophy.
- They had to know the influence of Kant's.
- Bohr was imbued by philosophy listening.
- Wittgenstein mentions only Schopenhauer.

It is clear that Bohr and Wittgenstein
never influenced each other

Any influence is through:

The Zeitgeist

Wittgenstein was to study with Boltzmann

An amateur in Vienna

Ludwig Boltzmann

1844-1906

Professor of Natural Philosophy in 1903

Indeed if Moltke was made a member of the historical division of the Berlin Academy because he had not written but made history, perhaps I too was chosen not because I had written about logic, but because I belong to a science that offers the best opportunities for daily practice in strict logic.



Boltzmann trusted the
directions by experiment!

Boltzmann 1

- Absurd to disprove the existence of matter.
- Best theories selected by a Darwinian process: *falsification*.
- What leads to correct deeds is true. (*James*)
- Concepts we can form as we wish.
- To make myself understood, I must use a language where all exists on the same footing.
- We can not derive nature from our concepts.

Boltzmann 2

- Ask if life has a value makes no sense.
- I regard the existence of these questions themselves as an illusion.
- Philosophy of the future is to formulate the fundamental concepts in such a way that we obtain precise instructions how to intervene in the world of phenomena.
- **Wittgenstein**: *he has failed to give meaning to certain signs.*

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Wittgenstein' s work

- *Tractatus...* (1921 ?):

- The world is what is the case.
- Existence of states of affairs is the case.
- A thought is a proposition with a sense.

This describes a *classical world*.

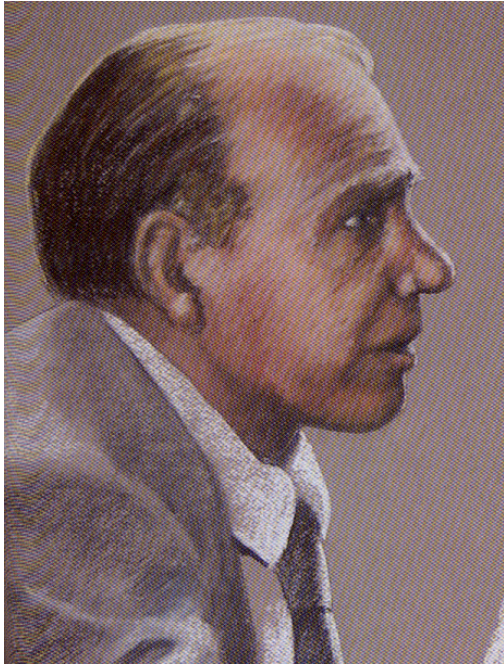
- *Philosophical investigations* (1968)

- Collects mature results of later works.
- There are no complete sets of (independent) attributes.
- Games and life-forms have limited applicabilites.
- Analysis may be stopped.

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Niels Bohr



L. Wittgenstein



Niels Bohr



L. Wittgenstein



Reality

Every doubt regarding the reality of atoms has been removed. The quantum states possess as much or as little reality as the elementary particles themselves.

Wittgenstein uses the term 'projection' where physics uses 'rules of correspondence' .

Language

We are suspended in language in such a way that we can not say what is up and what is down.

We struggle with language.

Philosophy is a battle against the bewichment of our intelligence by means of language.

A clear analysis leads to perspicuous presentation.

We have only one language and it is our everyday language.

Experiments

The word 'measurement' is used in the plain meaning of a standard comparison.

A system of propositions is laid against reality like a ruler.

Thus we test only whole systems not individual propositions.
A description is verified or falsified by a comparison with reality.

Why should there not be a physical law connecting a starting and finishing state of a system, but not connecting the intermediate state?

What leads to correct deeds is true.

Phenomenon

The phenomenon is an object existing only as an immediate integral experience, it can not be regarded as an independent object, even if as an observation it is presented to not created by consciousness.

Use of the word 'phenomenon' is to be restricted to descriptions including an account of the whole experimental arrangement.

We may alter a phenomenon by altering its conditions.

A proposition can be verified but a hypothesis only supported.

State space

The state of a classical system is 'phase space' . The state of a quantum system is Hilbert space.

The state is prepared by a ' projection' operation.

Wittgenstein considers all logical systems in a logical space. Only in such a space can we discuss what is not logically possible.

Wittgenstein introduces the logical multiplicity of the space. When a fact is laid against reality it becomes a proposition. This comes with its logical multiplicity.

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Summary of argument

- We can not explain consciousness, but we all experience it.
- It receives information about our ambience and internal impulses.
- We have to construct our world from this.
- It seemed that the world was certain and manageable.
- This order was lost.
- The impetus grew from Copenhagen and Vienna.
- As its prophets I have chosen Bohr and Wittgenstein.
- They presented a novel epistemology.
- This modern view is neither holistic nor manageable.