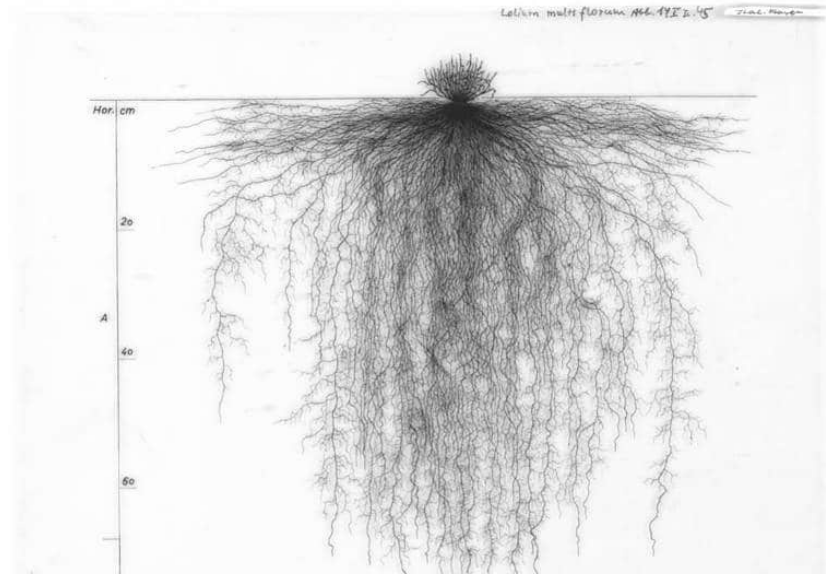


Roots of Niels Bohr's Thought

Hans Halvorson

Roots of Niels Bohr's Thought

- Hans Halvorson



Not so secret: Trouble with physics

- 2

Pointing the finger: Bohr was a positivist

- “Without doubt, Bohr’s philosophical views have shaped the way generations of physicists think about quantum mechanics, but they have also, in the eyes of an increasing number, discouraged and stifled progress.” (Jim Al-Khalili, 2020, p 122)
- 3

Pointing the finger: Bohr was unclear

- “While imagining that I understand the position of Einstein, ... I have very little understanding of the position of his principal opponent, Bohr. ... Indeed, I have very little idea what this means. I do not understand in what sense the word ‘mechanical’ is used I do not know what the italicized passage means.” (John Bell, Bertlmann’s Socks)
- 4

Pointing the finger: Science has forgotten its humanist roots

- 5

- “Bohr’s ideas were not located in their proper background, either scientific or philosophical, until quite recently.”
- 6

- “Every unambiguous communication about the state and activity of our mind implies of course a separation between the content of our consciousness and the background loosely referred to as ‘ourselves’ but any attempt at exhaustive description of the richness of conscious life demands in various situations a different placing of the section between subject and object.”
- 7

“In order to illustrate this important point, I shall quote a Danish poet and philosopher, Poul Martin Møller, who lived about a hundred years ago and left behind an unfinished novel called “The Adventures of a Danish Student”, in which the author gives a remarkably vivid and suggestive account of the interplay between the various aspects of our position . . .” (Bohr 1960, p 65)

• 8

Bell, Al Khalili, and their ilk are hamstrung. They cannot see the root system.

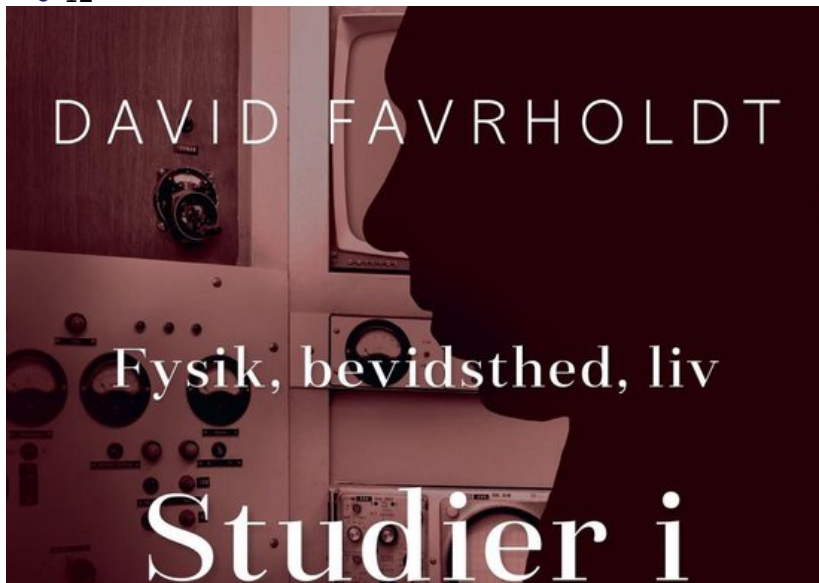
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- 10
- “Bohr’s interpretation was rooted into every detail of the long genesis of atomic physics, and it was formulated within the philosophical language that developed in the German culture starting with Kant.”
(Catherine Chevalley)

Bohr as Kierkegaardian?

- “There can be no doubt that the Danish precursor of modern existentialism and neo-orthodox theology, Søren Kierkegaard, through his influence on Bohr, affected also the course of modern physics to some extent.” (Jammer 1966, p 173)
- 11





- “Of course, a lot has already been written about Bohr’s philosophy, but unfortunately not many people have been able to see the depth of it and its new vision when it comes to traditional philosophical issues.” (Favrholdt, FNB)
“I consider Niels Bohr to be one of the greatest thinkers in human history.” (Favrholdt, FNB)
- 13

- “Do we have any reason at all to believe that Bohr was influenced by Kierkegaard’s philosophy? The answer is in the negative.” (NBFB, p 62)
“If we wish to speak of an influence in this case, the influence is actually an antithetical one. And if in his first reading of Kierkegaard Bohr reacted against his ideas, then the roots of his own view must be sought elsewhere.” (NBFB, p 54)
- 14

- “Neither Kierkegaard nor Høffding mentions an arbitrary dividing line between subject and object. Only in Poul Martin Møller’s writings do we find this idea.” (NBPB, p 57)
“It seems that [Harald] Høffding played little or no part as regards the formulation of Bohr’s specific contribution to philosophy.”
- 15

Contra Favrholt, the proper way to understand “influence” on Niels Bohr’s thought is via transformation. Not direct transmission from texts, but more like absorption from the cultural soil. Kierkegaard’s ideas are in the mix – as are the ideas of many other 18th and 19th century thinkers.

• 16

- Bohr The moveable line between subject and object “Unambiguous”
Complementarity is an objective description Classical concepts
Analysis and synthesis Mechanism versus vitalism Free will No “God’s
eye view”
- 17

Bohr's proximal philosophical influences

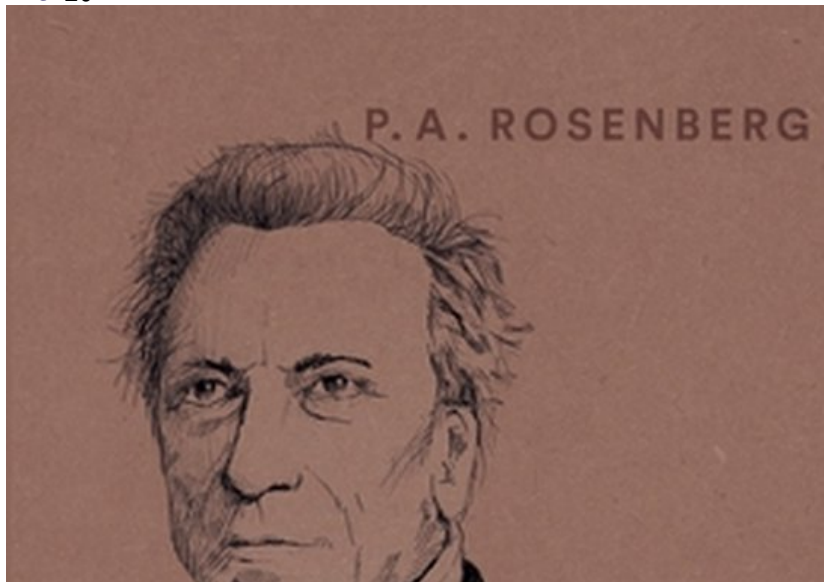
- Bohr read *Stadier paa Livets Vei* Bohr's father was friends with Harald Høffding Bohr took a year of Filosofikum (teacher was Høffding)
Bohr's father took a year of Filosofikum (teacher Rasmus Nielsen's)
- 18

Harald Høffding (1843-1931)

- 19

Rasmus Nielsen (1809-1884)

• 20



A single data point in English

- SK and RN were contemporaries and friends for a couple of years. Then SK accused RN of stealing his ideas.
See Jon Stewart, “Rasmus Nielsen: From the Object of ‘Prodigious Concern’ to a ‘Windbag’.”
- 21

The once-famous Rasmus Nielsen

- “No one who studies the life of the mind in nineteenth-century Denmark, will be able to skip over [Nielsen’s] great philosophical writings, and everyone who got to hear his lectures at the university will remember him as a great awakener and a rare personality.” (Brandes 1899)
- 22

The once-famous Rasmus Nielsen

- Nielsen taught several generations of the most distinguished scientists, philosophers, and humanists in Denmark Taught Filosofikum from 1841 to 1882 Published thousands of pages of philosophy Nothing of Nielsen's has been translated into a “world language”
- 23

Nielsen's students

- 24
- J. Lange 1859
- G. Brandes 1859
- H. Høffding 1861



“At first it was Rasmus Nielsen, whose enthusiastic references to Kierkegaard and whose rousing eloquence had the greatest influence on me.” (Høffding 1909)

- 25

- 26

“You were originally a disciple of Rasmus Nielsen. Like others, you were subject to the attraction of this deft, sparkling virtuoso of intellectual skill, this Ole Bull of philosophy with his spark of life, against whom posterity is so cold because he was far too prevalent in his time.” (G. Brandes, Tale for H. Høffding, 1903)

• 27

- C. Bohr 1874
- K. Kroman 1868



Who was Rasmus Nielsen?

- 1809 bondefødt in Rorslev, Middelfart 1820 intellectual talents recognized by local priest
1829 begins studies at Viborg katedralskole
1830 SK matriculates at KU
- 29

Who was Rasmus Nielsen?

- 1832 graduated Viborg katedralskole
1837 teologisk embedseksamen 1839 SK's journal: satirical remarks about RN
- 30

Nielsen's Hegelian Period

- 1840 PhD: De speculativa historiæ sacræ tractandæ method
- 1841 SK PhD: Begrebet Ironi
- 1841 RN appointed chair of moral philosophy (Poul Møller's chair)
- 1842 SK remarks satirically about RN's unfinished system in Fædrelandet
- 1845 Den Logiske Propædeutik
- 31

- 1846 SK. Afsluttende Uvidenskabelig Efterskrift
1848 SK and RN begin taking regular walks together. SK: RN is the only one of the younger thinkers in Denmark who “may amount to something”.
1849 RN. Evangelietroen og den moderne Bevidsthed
SK: “The writings are plundered in many ways . . . And then my conversations!”
- 32

- 1849 Martensen. Den Christelige Dogmatik
1849 RN. Mag. S. Kierkegaards "Johannes Climacus" og Dr. H. Martensens "Christelige Dogmatik." En undersøgende Anmeldelse.
1850 RN. Evangelietroen og Theologien
- 33

- 1855 Om Theologiens Naturbegreb med særligt Hensyn til Malebranche: De la recherche de la verité
- 1857 Philosophisk Propædeutik i Grundtræk
- 1857 Philosophie og Mathematik. En propædeutisk Afhandling
- 1859 Mathematik og Dialektik
- 34

“As my recent writings show, it has been my goal, for several years, to clarify and demonstrate the relationship between philosophy and the separate sciences as comprehensively as possible. The future of philosophy depends in an essential way on a thorough understanding and accurate determination of this relationship.” (1864, p 18)

• 35

The second battle about faith and reason

- 1864 Nielsen. Grundideernes Logik. “Tro og Viden er uensartede Principper”.
- 1866 Brandes. Dualismen i vor nyeste Philosophie
- 1866 Høffding. Philosophie og Theologie
- 1867 Nielsen. Om ‘Den Gode Villie’ som Magt i Videnskaben
- 36

The so-called Heisenberg cut

- Bohr talked about a moveable boundary (skillelinien) between subject and object Contemporary physicists are confused John Bell: “The shifty split” “The first charge against ‘measurement’, in the fundamental axioms of quantum mechanics, is that it anchors there the shifty split of the world into ‘system’ and ‘apparatus’.” (Against Measurement)
- 37

“Ordinary language, by its use of such words as thoughts and sentiments, admits typical complementary relation between conscious experiences implying a different placing of the section line between the observing subject and the object on which attention is focused.”

“In fact, the varying separation line between subject and object, characteristic of different conscious experiences, is the clue to the consistent logical use of such contrasting notions as will, conscience and aspirations, each referring to equally important aspects of the human personality.”
(Bohr 1953, pp 389-390)

- 40

“In emphasizing the necessity of paying proper attention to the placing of the object-subject separation in unambiguous communication, the modern development of science has created a new basis for the use of such words as knowledge and belief.” (Bohr 1955, p 61)

• 41

- 43

• 44

20

Nr. 1. HARALD HØFFDING:

ger) kan vi ikke tænke os. Men et idealiseret Menneske-subjekt (S_m) maatte besidde en Forstaaelse af, hvorfor forskellige empiriske Subjekter ($S_\alpha S_\beta S_\gamma \dots$), alle hørende ind under S_m , maatte komme til forskellige Opfattelser.¹ S_m er selv i stadig Udvikling, og den fulde Sandhed vil ikke blot bestaa i en objektiv Lære, men ogsaa i en Forklaring af, hvorfor ikke alle forskende Aander opfatter Sagerne paa den Maade, den objektive Lære angiver.

Høffding, Den Menneskelige Tanke (1910)

- 45

Why has Nielsen been neglected

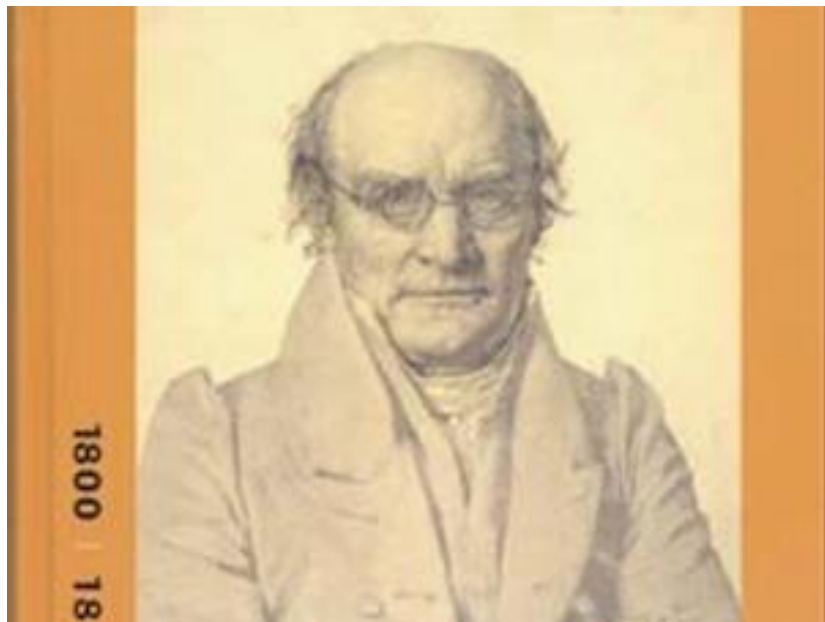
- Abstract and heavy writing style Challenged scientists' authority On the wrong side of Det Moderne Gennembrud
- 46

"Komplementaritetsfilosofien, som er Bohrs højst personlige og meget københavnske sammenfatning af kvantemekanikkens erkendelsesteori, stort set ikke er blevet forstået af det internationale fysikersamfund." Peder Voetmann Christensen, Springet fra København, Information, 7. okt 1985

• 47

”Men hvorfor prøver man så ikke at forstå den filosofi, som førte til Bohrs sikre forudsigelser? Det var jo ikke en krystalkugle, men logisk tænkning, som lå bag. Jeg tror, at svaret skal søges i, at Bohrs filosofi netop er meget københavnsk. Den bygger på nogle forudsætninger, en særlig begrebslogik, som er udviklet i 1800-tallets København, men som ikke specielt har noget med fysik at gøre.”

● 48



Kierkegaard og Rasmus Nielsen

af HELGE HULTBERG

Til Steffen Steffensen

»Samtidighed« er et af de ord, som Søren Kierkegaard for altid har været med til at præge. »Det Forbigangne er ikke Virkelighed: for mig; kun det Samtidige er Virkelighed for mig.«¹ På dette trin er det endnu helt alment holdt, men naturligvis er det specielt samtidigheden med Jesus, det drejer sig om. Først når vi forsøger at gøre os samtidige med ham, forstår vi, hvem vi er, og vi må indrømme, at vi ikke slår til. Eller vi kniber udenom: Den forstandige siger i samtidighedens situation: »Han er bogstaveligen Ingenting.«² Nu 1800 år efter er det let nok at sværme for Jesus, at kalde ham Guds søn, men det tæller ikke:

»Pas vel paa dette om Samtidigheden; thi ikke kommer det an paa, hvad Stads Du gjør for en Afdød, nei; men dette, hvad Du gjør i Sam-

Hans Halvorson

