

THE NIELS BOHR ARCHIVE

Annual Report 2013

The Niels Bohr Archive is an independent institution overseen by the University of Copenhagen

Staff

Director	Finn Aaserud
Academic Assistant	Felicity Pors
Librarian/Secretary	Anne Lis Rasmussen
Postdoc	Thiago Hartz (from October)
Temporarily employed	Kira Moss (May to November)
Temporarily employed	Torkil Bang (November to December)

Board of directors

For the Vice-Chancellor of the University of Copenhagen	Karin Tybjerg
For the Niels Bohr Institute (NBI)	Andrew D. Jackson, chair (until November) Nils Overgaard Andersen (from November)
For the Royal Danish Academy of Sciences and Letters	Jørgen Christensen-Dalsgaard
For the State Archives (<i>Rigsarkivet</i>)	Asbjørn Hellum
For the family of Niels Bohr	Vilhelm Bohr (chair from November)

General remarks

The Niels Bohr Archive (NBA) – website nba.nbi.dk – is a repository of primary material for the history of modern physics, pertaining in particular to the early development of quantum mechanics and the life and career of Niels Bohr. Although NBA has existed since shortly after Bohr's death in 1962, its future was only secured at the centennial of Bohr's birth in 1985, after a deed of gift from Bohr's wife, Margrethe, provided the opportunity to establish NBA as an independent not-for-profit institution. Since 1985, the NBA has had its own board of directors and has received a fixed annual sum, covering part of the running expenses, from the Danish Ministry of Education (1985–1998 and 2000–2001), the Ministry of Research (1998–2000) and the Ministry of Science, Technology and Innovation (from 2001); it has supplemented its income by taking advantage of its privilege to apply for project support from private sources. In 1985 NBA had only a couple of offices, its archival collections were scattered in various rooms and the unique book collection was stored in boxes. Since then, the Niels Bohr Institute (NBI) has provided NBA with offices, library rooms and storage space for the archival collections. This has given better possibilities for the NBA staff to place archival documents in an acid-free environment in fireproof safes, to register the collections and to service the many guest researchers.

The core of the collections comprises the *Niels Bohr Scientific Correspondence* (BSC; 6,000 letters and drafts) and manuscripts (500 units). This material was catalogued and microfilmed in the early 1960s as part of the Archive

for History of Quantum Physics (AHQP), a project sponsored by the American Philosophical Society and the American Physical Society – website <http://www.amphilsoc.org/guides/ahqp/>. The outcome was 290 microfilms of various relevant historical material, which have been placed in several repositories world-wide, including NBA.

In addition, NBA houses several historical collections that cannot be consulted elsewhere. Thus, in 1985 the Bohr family donated the bulk of the *Bohr Private Correspondence* (BPC) which includes letters to and from central personalities in culture and politics inside and outside Denmark. The equally extensive *Bohr General Correspondence* (BGC) documents Bohr's substantial administrative involvement, whereas the *Bohr Political Papers* (BPP) shed light on his considerable effort, beginning during the Second World War, for an "open world" between nations.

Among papers of Bohr's closest colleagues deposited in NBA, only the George Hevesy Scientific Correspondence has been microfilmed, but the papers of, among others, H.A. Kramers, Christian Møller, Oskar Klein and Léon Rosenfeld are also of great historical interest. Some papers of more recent origin – notably those of Niels Bohr's son, Aage Bohr, of Niels Bohr's close collaborator, Stefan Rozental, and of Danish solid state physicist, Allan Mackintosh – have also been deposited. Finally, NBA houses photocopies of the papers of astrophysicist Bernard Peters and the papers of *Selskabet for Naturlærens Udbredelse* (SNU, the Danish Society for the Dissemination of Science, founded by H.C. Ørsted in 1824). The large collection of photographs relating to Bohr's career, thumbnails of which can be seen on the website, is an especially popular resource. Finally, there are reprint, film, sound tape, video tape and DVD collections, as well as a growing library.

From 2007 to 2012 the Danish Ministry of Science supported a pilot project to find, and to begin using, the best means to make information about NBA's collections and selected documents in them, available on the Internet. In the first stage of this project, all the documents in BPP as well as the majority of NBA's films and sound recordings were digitized and placed on the Internet. In a second stage, the major part of BPC and a supplement to BSC (BSC-Supp) were added. The digitization of archival documents has continued and the resulting files placed on the Internet, where they can be accessed by means of the Archon archives software developed at the University of Illinois. Web address archon.nbi.dk.

The main priority of NBA practically since Bohr's death has been the publication of the *Niels Bohr Collected Works* (BCW), the first volume of which was published in 1972 and the last (Vol. 12) in 2007. A new edition of the entire series, on paper as well as an ebook, was published in 2008 with an additional volume containing a cumulative subject index. A list of the volumes is posted on NBA website <http://www.nba.nbi.dk/files/bcw.html>.

After the completion of BCW, NBA is able to conduct limited independent historical research as well as to provide greater service for the many researchers

making use of its collections, and to concentrate on its activities, instituted in early 1999 upon consultation with the Ministry of Research, to disseminate natural science for the public, particularly gymnasium (high-school) students.

As of 1 January 2012, after several years of negotiations, NBA is an independent institution overseen by the University of Copenhagen. New statutes have been approved and a new board of directors, with a representative from the Danish National Archives (*Rigsarkivet*) replacing the representative of the Danish Ministry of Science, Technology and Innovation, has been appointed. In connection with NBA's new status, the Ministry agreed to increase the annual support provided through the University of Copenhagen to cover fully the salaries of its small staff and day-to-day expenses. This means that NBA no longer needs to rely on external support for its survival, which gives more freedom to apply for funding for new and innovative archival, scientific, historical and outreach projects.

Normal activities in 2013

With regard to new acquisitions, NBA has received archival material left by the recently deceased philosopher David Favrhøldt, namely papers pertaining to research on Niels Bohr. The remaining papers of Favrhøldt are deposited at the University of Southern Denmark, where he was professor. A valuable book collection, and a small collection of unorganized papers, from Bohr's close collaborator Jørgen Kalckar, who died in September 2012, have been deposited by the family. Bente Faltinsen, a Norwegian relative of Niels Bohr's wife, Margrethe Bohr, has donated a collection of photographs of Bohr and family. Aage Bohr's daughter, Paula Bohr, has donated a collection of books and reprints, whereas the Danish Technical University (DTU) has donated a signed set of reprints by George Hevesy.

There has been considerable work on collections already deposited. The substantial collection of letters (1932–1954) from the physicist N.O. Lassen to his parents has been scanned by Lis Rasmussen and will be made available to *bona fide* researchers on Archon when the family has given permission. The documents in the twelve large boxes of archival material that was severely water-damaged in the rainstorm of 2011 have been organized and registered. The documents in the remaining 72 boxes of material that was also hurriedly removed after the rainstorm, but which proved not to be water-damaged, are not yet organized. The important collection of letters between Niels Bohr and his brother Harald is in the process of being scanned and transcribed by Lis Rasmussen. It will be made available to *bona fide* researchers on Archon upon agreement with the Bohr family after the transcriptions have been finally proofread. Lindau Mediateque has set up a link to Bohr's so-called "last lecture," held at the meeting of Nobel laureates in Lindau in the summer of 1962. NBA has provided the same link, and will later supplement with related material – notably the description of the trip by Niels Bohr's eldest grandson, Christian Bohr, who travelled with Bohr at the time. A necessary clean-up of BPC in Archon has been conducted by Kira Moss, in order

to correct the many non-functioning links to scanned documents. She has also worked to incorporate unregistered and newly found photographs in the digitized photo collection.

Among several applicants who have been evaluated by an international committee of experts, the NBA Board of Directors appointed Thiago Hartz from Brazil to the two-year postdoc position supported by the Novo Nordisk Foundation in connection with the 100th anniversary in 2013 of Niels Bohr's atomic model. Hartz arrived in October, after defending his PhD in Brazil. He will be studying the research regarding quantum gravity carried out at Bohr's institute and Nordita in the 1950s and 1960s. It is hoped that his presence will be useful for the relationship and collaboration between NBA and NBI and that Hartz's research will increase the interest among historians in Bohr's institute after the Second World War.

There is considerable interest by researchers in the letters written by Hanna Adler, the sister of Niels Bohr's mother, from the United States to her family in Denmark at the end of the 19th century. Hanna Adler was a pioneer educationalist, who started the first co-educational school in Denmark. Her U.S. trip was made in order to gather experience towards this end. The Danish historian Iben Vyff has shown special interest, and the Bohr family foresees the publication by her of an annotated version of the letters. There is also interest in the biography of the Danish geologist Inge Lehmann, who was Niels Bohr's contemporary, and with regard to whom NBA contains a small amount of archival material. The Danish researcher Lif Jacobsen has applied for support for preparing a biography of Inge Lehmann, which she will write at NBA if money is granted.

NBA has received twelve sets of Chinese version of the *Niels Bohr Collected Works*, a full version of which has been published in China for the first time on the basis of the translation over several years by the late Professor Ge Ge.

There have been about 150 guests at NBA over the year. Among researchers may be mentioned the school teacher Jens Tommerup, who investigates the influence on Niels Bohr of the school he attended for twelve years, Gammelholm Skole. Filip Grygar from the Czech Republic, Reidun Renstrøm from Norway, and Kristian Camilleri from Australia have also carried on research in NBA's collections. As usual, there have been several groups visiting, not only high school classes and other groups from Denmark, but also groups from England, China, and Japan. The Korean Educational Broadcasting System has visited to film at NBA for a TV series devoted to the history of science, and the Danish film maker Liv Thomsen and collaborators have visited to prepare a new biographical film about Niels Bohr in celebration of the 100th anniversary of his atomic model, which was later shown at the film festival organized by NBA and Cinemateket (the *Cinematheque*) later in the year (see below).

Centennial for the Bohr atom

Indeed, the year of celebration has occupied much of NBA's time and effort in the course of the year, and NBA has contributed to the arrangements of others as well as organized events and published books and articles on its own. Both NBA's

director and the chairman of the board have served as members of a committee established by NBI in order to coordinate all celebratory events during the year.

By far the largest arrangement organized by NBA alone was a two-day international history of science conference 12–14 June. The conference was supported in part by the Carlsberg Foundation and was held on the premises of the Royal Danish Academy of Sciences and Letters (KDVS), where Bohr was President from 1939 to 1962. The conference was fully booked, and about 30 speakers from around the world spoke on various aspects of Bohr's life and career. A committee of referees has been appointed to evaluate written version of the talks, which will be published by KDVS as a Proceedings from the conference.

As already mentioned, at the end of the year NBA organized a film festival in collaboration with Cinemateket in Copenhagen. Two entirely new films were shown, namely *An Entangled World* by Lars Becker Larsen and *Niels Bohr: The Dane Who Changed the World* by Liv Thomsen, together with many classical movies about Bohr. In many cases the directors presented their films, and there were animated discussions in which the audience took part.

The NBA Director's proposal to organize an international conference on the possible relevance today of Niels Bohr's concept of an "Open World" was realized under the leadership of political science professor at the University of Copenhagen Ole Wæver. The conference, which was opened by the Danish Crown Princess Mary, was held in the ceremonial hall of the University of Copenhagen with high-level international participation from many fields. A follow-up conference will be held in Rio de Janeiro in 2016.

NBA is responsible for two books published in connection with the celebration, one in English and one in Danish. The first, *Love, Literature and the Quantum Atom: Niels Bohr's 2013 Trilogy Revisited* is coauthored by Director of NBA, Finn Aaserud, and historian of science John L. Heilbron. The book was made possible by the Bohr family giving Aaserud permission to see the otherwise closed personal correspondence between Niels Bohr and his fiancée Margrethe Nørlund before, during, and after Bohr's stay in England 1911-1912, which was formative for his career and which laid the ground for his atomic model. Apart from two long essays written respectively by Aaserud and Heilbron, the book includes a reprint of Bohr's original "Trilogy," in which the atomic model first appeared in print. The book is published by Oxford University Press. The second book, *Bohr på ny*, edited by Lone Bruun, Helge Kragh and Finn Aaserud, contains new articles by historians who have studied Bohr's life and by people who have known him. The authors include David Favrholt, whose article needed to be completed by the editors upon Favrholt's death, and Haldor Topsøe. The book is published by ForlagetEpsilon.dk. NBA has collaborated on the republication in 2013 by the publisher Philosophia of the Danish version of Niels Bohr's three booklets of philosophical articles, now entitled *Niels Bohr, Filosofiske Skrifter, Vols. I–III*. An additional *Vol. 4* of articles not previously published together is in preparation.

As for smaller publications, NBA has collaborated with the Niels Bohr Library and Archives of the American Institute of Physics to produce a calendar for 2013 celebrating the Bohr atom, which has been sold on the Internet. Aaserud has furthermore contributed articles on Bohr for Copenhagen University's 2013 *Almanak*, for a booklet for school children prepared by Danish physicist Erland Andersen, for the Yearbook of the Carlsberg Foundation, and for a booklet for high-school students prepared by Niels Elbrønd Hansen from Frederiksberg Gymnasium. Finally, NBA has contributed to short films about Niels Bohr, one made for the Copenhagen museum *Eksperimentarium*, and another in the series "Behind the Yellow Wall" (*Bag den gule mur*) about people buried in the Assistens Cemetery (*Assistens Kirkegaard*) in Copenhagen produced by *Kulturcenter Assistens*. The latter film can be seen at <https://www.youtube.com/watch?v=UM5sW48Sshk>.

Aaserud has given several talks during the celebratory year: the Lundbeck lecture at Experimentarium in January; talks at the Society for the Dissemination of Science (SNU) in February, at the People's University (Folkeuniversitetet, two lectures), for the Copenhagen Jewish Congregation (*Mosaisk Trossamfund*) in June; at the International Congress of the History of Science in Manchester in July; at the conference on creativity in KDVS in October (where Vilhelm Bohr, the representative for the Bohr family on the NBA board of directors also spoke); at a memorial conference, also held in October, for Niels Bohr and Henry Moseley in Manchester, and at NBI in December in connection with NBI being made a "historic site" by the European Physics Society. Vilhelm Bohr and Karin Tybjerg, the representative on NBA's board of directors for the Vice-Chancellor of the University of Copenhagen, have given talks at a colloquium at the State Hospital (*Rigshospitalet*), celebrating Niels Bohr and his institute's contributions to medical research, notably isotopic tracers.

NBA has contributed much material to an exhibit at the Danish Royal Library in Copenhagen, in connection with an event of Nobel Prize laureates celebrating the centennial. NBA has also provided material for exhibits at the Ecolarium (*Økolariet*) and the El-Museum (*El-Museet*), respectively in the Danish towns of Vejle and Bjerringbro.

Professor Andrew D. Jackson, chairman of the NBA board of directors since 1998, left the board in November. He is replaced as NBI's representative by Nils Overgaard Andersen, while Vilhelm Bohr has taken over the chairmanship. On behalf of the board of directors and myself I would like to thank Professor Jackson for his efforts for NBA over the years.