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Book review

Matthias Dörries (Ed.), Michael Frayn's *Copenhagen* in Debate: Historical Essays and Documents on the 1941 Meeting Between Niels Bohr and Werner Heisenberg. Office for History of Science and Technology, University of California, Berkeley, ISBN 0-9672617-2-4, 2005 (viii + 195pp., \$12.00pbk)

Michael Frayn's stageplay *Copenhagen* opened in London on May 28, 1998, with subsequent performances worldwide to high critical acclaim (Frayn, 2000).¹ In the play, Niels and Margrethe Bohr and Werner Heisenberg reside in Heaven and contemplate on the notorious Bohr–Heisenberg meeting of September 1941, which they attempt to reconstruct in endless cycles, without reaching a conclusion. Frayn's philosophical point is that it is impossible to know our motives, explaining why neither historians nor the actors themselves know what “really” happened in Copenhagen. In my opinion, the main strength of the drama lies in the brilliant interplay between the political tension separating the protagonists and their differences about physics.

The German edition of the play (Frayn, 2003) included Frayn's Postscript (originally published in Frayn, 2000), as well as a number of essays by leading historians on the context of the play. In addition (from the third expanded edition onwards), it contained the drafts of the letters from Bohr to Heisenberg, written between 1957 and 1962, that were released in February 2002 in facsimile and transcript (original and translation).² The book under review is basically an English version of this third expanded German edition, strangely lacking the play itself, Frayn's Postscript, and the essay by Michael Hagner, however. The contributors are Finn Aaserud, Cathryn Carson, David Cassidy, Michael Eckert, Klaus Hentschel, Dieter Hoffmann, Gerald Holton, Thomas Powers,³ Helmut Rechenberg, Paul L. Rose, and Mark Walker. The editor is to be congratulated at having assembled so many acknowledged experts in the field, also because their diverse interests and opinions guarantee that this collection of essays provides a broad and representative vista on both Frayn's play and the underlying Bohr–Heisenberg meeting.⁴

Indeed, the diversity of opinions remains and the authors taking positions at the extreme ends of the spectrum (i.e. portraying Heisenberg either as a hero or as a villain) appear to

¹For example, the play won the prestigious Tony Award. I find the corresponding film *Copenhagen* from 2002 available on dvd in the PBS *Hollywood Presents* series, even better than the play. The actor who plays Heisenberg in this film, Daniel Craig, is the current James Bond.

²These letters are available in any case at <http://www.nbi.dk/NBA/papers/docs/cover.htm>.

³The rather flattering portrait of Heisenberg in Powers's book *Heisenberg's War* from 1993 formed the original inspiration for Frayn.

⁴For a general background also see Cassidy (1992) and Walker (1995).

have learnt nothing from either Frayn's play and general outlook or from other commentators.⁵ Now, the diversity of possible interpretations of the meeting compatible with the evidence is precisely one of the points of Frayn's play; Rechenberg quite rightly points out that the testimonials by Heisenberg and Bohr themselves do not really contradict each other, as is often suggested (though distorted versions thereof do, in the form they have unfortunately appeared in the literature). But this compatibility by no means justifies the extreme positions evidently still held by Powers and Rose, whose exaggerations and misinterpretations have been pointed out in numerous book reviews.⁶

Another interesting idea presented by Rechenberg is that Bohr's discontent with Heisenberg (and Weizsäcker in his wake) at Copenhagen laid not so much in anything related to the German nuclear program, but in the combination of Heisenberg's assurance that Germany would win the war with his advice to Bohr that—in his own best interest—he should therefore collaborate with the victor by contacting the German Embassy.⁷ This reading is certainly consistent with Bohr's letters, although both Eckert and Hentschel draw attention to the possibility that Bohr's memory may be just as flawed and/or influenced about later events as Heisenberg's—a point routinely made about the latter but not the former.⁸ In fact, as Rechenberg shows, Heisenberg's account, which is best known from his autobiography from 1969, actually dates back to 1948, almost a decade before Bohr took up his pen.

Apart from the general and instructive comments by Aaserud, by Hentschel, and by Holton,⁹ and the chapter by Rechenberg already discussed to some extent, I think the most interesting contributions are those by Carson, Eckert, and Hoffmann.¹⁰ The parallel between Heisenberg and the German astrophysicist Walter Grotrian drawn by the latter is quite telling. Carson traces the way Heisenberg's views found their way into Jungk's infamous book *Brighter Than a Thousand Suns* from 1956 in an incomplete and distorted way; one should be aware of the fact that Bohr's irritation with Heisenberg, which led him

⁵See Landsman (2002) for a comprehensive review of the literature on Heisenberg to date.

⁶As I wrote one of these (Landsman, 2002), let me point out that Rose is even unimpressed by Bohr contradicting one of his speculations-turned-into-facts: in *Heisenberg and the Nazi Atomic Bomb Project* he says “The discussion must have become quite technically specific on these matters” (i.e. uranium, plutonium, slow neutrons) (p. 156), whereas in the book under review he correctly states that “Bohr is so clear in his letters that no specific technical details were discussed” (p. 86). Nonetheless, he claims Bohr's letters support his views. Rose also repeats his point that Heisenberg and Weizsäcker went to Copenhagen on an intelligence mission, an idea not confirmed by e.g. the detailed reconstruction of the trip by Walker (1995), which is repeated in the book under review. In fact, it was rather difficult for Heisenberg to obtain permission for the trip. Of course, these documented difficulties might well have been a huge cover-up comparable with the theory that God created the world in 6 days including its fossil record.

⁷Unfortunately, Rechenberg falls into old habits by his “refutation” of Bohr's assertion that Heisenberg was working on the atomic bomb, consisting of “the historical fact that Heisenberg had been working exclusively on a reactor” (p. 73). Of course, until the program was scaled down in February 1942 it was impossible to separate these aspects.

⁸Weizsäcker first made this point in 2002, immediately after the release of Bohr's letters; see Landsman (2002, note added in proof).

⁹The former two are quite a bit more balanced than the latter; Holton apparently remains faithful to the line originating with Sam Goudsmit and brought to its extreme conclusion by Rose; see Landsman (2002).

¹⁰Cassidy essentially refers to his online *Physics Today* article from 2000, see <http://www.aip.org/pt/vol-53/iss-7/p28.html>, and Walker does not present new work either; his paper is a summary of relevant parts from Walker (1995).

to draft the series of unsent letters from 1957 onwards, was triggered by Jungk's book, rather than by anything directly written or said by Heisenberg.

Eckert, in my opinion, makes the key point about Heisenberg and his behaviour during the Nazi era: "Wer für gemeine Ohren Musik macht, macht gemeine Musik".¹¹ Carrying Eckert's analysis a bit further, this is precisely the aspect of his behaviour which Heisenberg himself appeared to have been consistently blind to. Heisenberg thought he could remain true to himself in Nazi Germany (due to the chimera of "inner emigration"—admittedly widespread among German intellectuals at the time), carried on business as usual, expected to keep up his friendships with men like Bohr as if Denmark had never been occupied by the regime whose leading scientist he was,¹² and was amazed that former colleagues whose relatives had perished at Auschwitz refused to shake his hand after the war.¹³ He clearly believed that the Germany of Kant, Goethe, and Beethoven was still hiding underneath the surface of the Third Reich of Göring, Himmler, and Hitler, waiting to resurface after Nazi victory. One is reminded of the last words of Claus Schenk von Stauffenberg, right before he was executed the day after his unsuccessful putsch against Hitler on 20 July 1944: "Es lebe das heilige Deutschland!"¹⁴

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¹¹In English, this is even the title of his chapter: "He who plays for vulgar ears plays a vulgar tune". The original is due to the well-known emigrant German author Lion Feuchtwanger.

¹²Heisenberg's September 1941 letter from Copenhagen to his wife almost literally makes this point: "(...) everything has stayed so much the same as if nothing out there in the world had changed (...) It is amazing, given that the Danes are living totally unrestricted, and are living exceptionally well, how much hatred or fear has been galvanized here (...) In Bohr's institute I gave a short talk in Danish, of course this was just like in the old days (...)" See <http://werner-heisenberg.unh.edu/kop-letter.htm> for the complete letter in German, which was released by Heisenberg's children in May 2003.

¹³To me, the culmination of Frayn's play is where Heisenberg laments: "Hands that actually built the atomic bomb refused to shake mine!"

¹⁴Long live holy Germany!