Notwithstanding each historian's conviction about the correctness of his or her own interpretation, their continued disagreement underscores the uncertainty constituting the basis for Frayn's play, only making it more convincing. Furthermore, one thing all historians do agree about is that although the release demonstrates that Bohr was concerned about Heisenberg's reasons for coming to Copenhagen in 1941, the fact that he never sent the draft letters shows that he had great difficulty bringing the matter up with his close friend. Heisenberg's colleagues relate that Heisenberg's attitude was much the same. This adds weight to the imagined discussion between Bohr and Heisenberg in Copenhagen taking place in afterlife. In short, while the release has been unable to bring agreement among the historians, it only adds to the power of Frayn's play.

Nevertheless, the historians most critical of Heisenberg's actions during the war have continued to attack the historical premises of Frayn's play more acrimoniously than ever before. To my mind, these reactions confirm the tendency of many historians to view Heisenberg as either good or evil, something that *Copenhagen* in its dramatic form is refreshingly able to avoid.

As he is likely to agree himself, Frayn does not have the qualifications of a historian. Nevertheless, I think that in his play he has handled the uncertainties surrounding Heisenberg's visit to Copenhagen better than have many a historian. I furthermore disagree with the view of some historians that *Copenhagen* amounts to a falsification of history and as such is hurtful to the general public. Finally, I continue to take the *Postscript* in the published version of the play not as representing the dramatist Frayn's delusory posturing as a historian of science but rather as constituting an honest attempt to take up a dialogue with representatives of our field. After the attacks on his play and on his *Postscript,* Frayn can hardly be blamed for formulating his *Post-postscript* in the second edition of *Copenhagen* as a rebuttal on the rather narrow terms already defined by some historians.[14] Instead of entrenching our positions, I suggest that we historians of science take the continuing public interest and interdisciplinary approach opened up by Frayn's play as a welcome opportunity to take a broader view. Indeed, I think we need to leap at the opportunity for an open dialogue. In my view, such a dialogue may serve to enhance the quality and reach of the history of science as well as lead to useful self-reflection.

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tions to the release by Jeremy Bernstein, Gerald Holton, Thomas Powers, Paul Lawrence Rose, and Mark Walker.

14 A slightly revised version of the *Post-postscript* was published in the *New York review of books* (28 Mar 2002), under the title "'Copenhagen' revisited."

Reflections on *Copenhagen*

Cathryn Carson

What happened in Copenhagen in the fall of 1941? When Michael Frayn's play poses that question, it takes its place in a long chain of such queries. Heisenberg's visit and Bohr's reaction have engaged the interest of physicists, historians, and other observers, not to mention the participants themselves.

I am a historian, more particularly a historian who concerns herself with postwar West Germany. Working on Heisenberg after 1945, I have found it instructive to track the wartime meeting through its later representations. The postwar history helps make sense of the divergence of opinions still so vigorously expressed. The record, of course, is markedly thin. Bohr and his circle showed little interest in publicly retelling the events. I suspect Heisenberg, too, would have preferred to keep a public silence. As the unwelcome visitor, however, he felt a need—or was asked —to account for his actions. A postwar historian may have something to contribute.

To preface my comments: What happened in Copenhagen in the fall of 1941? I do not know. I am surprised that many of my colleagues believe that they do; less so, however, that they then disagree. The account of the Third Reich's fission research that I find most persuasive is that given by Mark Walker now more than a decade ago, which emphasizes reasoned administrative decisions, culminating in mid-1942, not to advance the project to an industrial scale under consideration of the worsening war conditions. Suggestions that its fate was determined by either mistakes or sabotage seem to me distinctly less well founded. Evidence can be cited for both accounts, but I find it less than compelling. Other authors will of course disagree. If one accepts Walker's narrative, however, the fall of 1941 becomes, as in the play, a moment of a certain lability, when the early successes of the Wehrmacht in the Russian campaign overlapped with developments within the "uranium project."

As for Heisenberg's attitudes, on which many reactions to the play have centered, these seem to me notably less determinable. There is no facet of his behavior that cannot be understood in more than one way: his travels under the aegis of Nazi cultural propaganda, his association with the 1944 conspirators who tried to assassinate Hitler, his remarks to foreign colleagues about his hopes for the war, his participation in the fission project itself. The picture one draws depends on one's interpretive schema, as historians ought to be able to acknowledge. In the literature on the subject, the anecdotes retold with the most self-assurance and the conclusions announced in the most categorical language are often the ones other analysts find most dubious.

Where I come out: As I read Heisenberg's wartime writings and ponder his postwar career, I see a man of complicated loyalties and guarded intentions. In his postwar accounts, which I have reconstructed in some detail, I do not find a claim to have sabotaged the project out of resistance to Hitler.[1] Certain statements to this effect that still circulate under his name—for instance, a few newspaper interviews and the much-cited comments of his American editor, Ruth Nanda Anshen—bear only a distant relation to his own words. Instead, he would repeatedly say, the circumstances of the war and the decisions of 1942 took that matter out of their hands. He did maintain that he and his colleagues had worried about making a bomb, without having faced a moment of decision; they did not push the project forward, but they did not hold it back, either. That distinction seems characteristic of his postwar statements, which were as differentiated and shaded as only a master of language could make them. Whether he had been morally concerned during the war: here contemporary evidence is lacking. I consider it unproven, though not implausible. But this is a highly speculative matter, and I am sure only that the debate will continue without end.

So what happened in Copenhagen in the fall of 1941? Heisenberg raised the question with Bohr in the late summer of 1947, when his British minders arranged a visit to Denmark. So far as we know, neither man wrote down immediate recollections. But judging from Heisenberg's statements thereafter, they did not find a common perspective. Bohr does not seem to have been anxious to pursue the matter. Heisenberg put his interpretation to paper in 1948. Colleagues outside of Germany wanted an account: not only of his role in the Uranverein, but also his pattern of wartime remarks to acquaintances abroad. In a cautious letter to a friend in America and a short memo in his files, Heisenberg laid out how he remembered the encounter.[2]

1 Cathryn Carson, "New models for science in politics: Heisenberg in West Germany," *HSPS, 30:1* (1999), 115-171.

2 Heisenberg to van der Waerden, 28 Apr 1948, Goudsmit Papers, American Institute of Physics, College Park; memo [1948], Werner-Heisenberg-Archiv, Munich.

Central to his account in these early documents was the plutonium possibility and the growing evidence that a reactor would work. By the fall of 1941, the plutonium route to a bomb had seemed feasible in principle. Heisenberg now said that he had wanted to discuss the prospect with Bohr, asking whether it was right for physicists to work on the problem. Exactly what he had hoped from his Danish colleague, he did not articulate; he wrote nearly as circumspectly as he recalled speaking in Copenhagen. In any case, as he now recorded it, Bohr had responded with the question: Did he foresee military applications? Heisenberg had answered affirmatively, so he said, and reiterated his question, with a skeptical Bohr replying that in war every physicist could only work for his country. In his memo Heisenberg added that he had stressed the difficulty of producing bombs in practice, that Bohr had seemed uneasy and loath to take up his question, and that part of the trouble, he now wrote, had surely been that Bohr had disapproved of his participation in local Nazi cultural propaganda. His colleague Hans Jensen, he also reported, later discussed things with Bohr in much greater detail. Somewhere beneath the surface, as I read these accounts, flickered an indeterminate and largely unarticulated apprehension about fission work in other countries.

Copenhagen was a delicate subject, and I suspect both Heisenberg and Bohr wished they could put it to rest. For Heisenberg, in particular, postwar reconciliation meant connecting onto old friendships and speaking only indirectly of the recent past. He did best with those colleagues abroad who were willing to go along—Edward Teller, Max Born. I would tend to count Bohr in that group, at least at the start. After 1947 the two men evidently let the wartime visit rest, while they continued to associate on formal and informal occasions. Through the early 50s, the meeting remained an open secret in the physics community. After the earliest postwar encounters, it became a subject for discreet commentary but not open confrontation.

The matter truly came into the public sphere with Robert Jungk's famous book *Brighter than a thousand suns*, first published in German in the fall of 1956. Neither Bohr nor Heisenberg had been eager to speak with the journalist. In response to Jungk's initial request for an interview, Heisenberg had declined "even an indirect involvement."[3] The writer, visiting physics conferences, eventually caught up with Heisenberg in Pisa, with Bohr in Geneva. But while Jungk eventually won Heisenberg's cooperation, he failed to do the same with Bohr.

3. Heisenberg to Jungk, 14 Feb 1955, Werner-Heisenberg-Archiv.

Jungk's report of the visit was embedded in a larger framework. His central concern was the weapon itself and the disintegration of an international scientific community coopted by national military needs. As a sidelight to the narrative of the Manhattan Project and the H-bomb, Jungk suggested that the wartime German scientists had stalled their work out of moral compunction. Furthermore, he said that Heisenberg had gone to Copenhagen with their offer to keep the bomb from their government, if their Allied counterparts would do likewise. But Bohr's misunderstanding of Heisenberg's circumspection prevented him, so Jungk now suggested, from giving Heisenberg's remarks about the weapon's moral dubiousness the appropriate attention. This was for the journalist the visit's unhappy ending.[4]

Jungk's reconstruction of the conversation did not follow Heisenberg's exactly. He had his actors pose different questions from those Heisenberg recalled, and his Bohr expressly denied the feasibility of constructing a bomb. Yet his account showed signs of having heard the story from Heisenberg or, what seems to me more likely, a close colleague. Then later editions and translations of his book excerpted a letter by Heisenberg relating the physicist's version of the Copenhagen events. This was Heisenberg's first public recounting of the visit and must have been a coup for Jungk. Often the physicist's remarks are understood as confirming the author's thesis. As I read the documents, they suggest the opposite intent.

Heisenberg and his circle found Jungk sympathetic and well-intentioned, particularly in comparison to other commentators on the German fission project. This was evidently why they agreed to cooperate. That did not mean, however, that they wholly approved of his representations. Soon after the book's appearance, in November 1956, Otto Hahn wrote Jungk with a number of criticisms. Carl Friedrich von Weizsäcker sent nineteen friendly but clear pages of corrections, prefaced by the remark, "I admit I am actually not happy about your book." Heisenberg commented to an associate that he thought Jungk had done his best to get at the truth; "Nonetheless," he observed, "the book naturally contains a lot that is false, and I have written Mr. Jungk a long letter with suggested changes for the next edition."[5]

In the months after publication Heisenberg eventually wrote Jungk two letters, affable but (in my reading) firmly intended to convey his own point of view. The first, from November 1956, dealt in part with the possibility of resistance in the Third Reich. Heisenberg laid out his view of working within the system and praised the anti-Hitler conspirators of 1944. In excerpting the letter, unfortunately, Jungk would omit the key sentence, "I would not want this remark to be misunderstood as saying that I myself engaged in resistance to Hitler."[6]

Then in mid-January 1957, in response to Jungk's express request, Heisenberg provided a second letter detailing his conversation in Copenhagen. His account was ringed with linguistic cautions about the reliability of his memory. Laying out the possibility and difficulty of the plutonium route, Heisenberg now stressed the ambivalent situation of the world's physicists midway through the Second World War: Either they could argue that building a bomb would be too hard, or that it was just barely feasible. At that moment, with the future still open, this could give them a potentially decisive influence. Heisenberg tersely described the resolution of his circle: "In this situation, we believed that a conversation with Bohr could be useful." He then reiterated his own version of the initial exchange with Bohr. Bohr misunderstood him, Heisenberg now wrote, in thinking his intention was to convey Germany's progress towards a weapon.

This much Jungk reprinted, with meager comment. In the process he cut Heisenberg off in mid-story. For, continuing on, Heisenberg now recounted his renewed question to Bohr. In a sentence framed with remarkable caution, he reported asking whether it was possible, considering the bomb's enormous difficulty and the accompanying moral issues, that all physicists might reach the same conclusion not to pursue it. Bohr had replied, according to Heisenberg, that there was no hope of influencing developments in the different countries, and physicists in each would inevitably work on weapons. Possibly concerned (with some cause) about what Jungk would make of this, Heisenberg sought to interpret Bohr's response for his correspondent. Whatever his own reasons, Heisenberg now explained, in practice his suggestion could only work to German advantage, since the Allies' prospects of making a bomb were distinctly greater than the Germans'.[7]

It is hard to say why Jungk cut out this passage, whether it was uncongenial or just too long and convoluted, whether he even noticed it differed from his own account. The physicist's depiction, however, was a touch less activist. If Heisenberg now stressed the scientists' influence and the hope of an understanding (less collusion than consensus) across

4 Robert Jungk, *Brighter than a thousand suns: A personal history of the atomic scientists* (New York, 1958), 99-102; in German, *Heller als tausend Sonnen: Das Schicksal der Atomforscher* (Stuttgart, 1956).

5 Hahn to Jungk, 11 Oct 1956 and 26 Nov 1956, Hahn papers, Archiv zur Geschichte der Max-Planck-Gesellschaft, Berlin; von Weizsäcker to Jungk, 6 Nov 1956, von Weizsäcker papers, Archiv zur Geschichte der Max-Planck-Gesellschaft; Heisenberg to Burhenne, 3 Jan 1957, Werner-Heisenberg-Archiv.

6 Heisenberg to Jungk, 17 Nov 1956, Werner-Heisenberg-Archiv; Jungk, *Brighter* (ref. 4), 91.

7 Heisenberg to Jungk, 18 Jan 1957, Werner-Heisenberg-Archiv; Jungk, *Brighter* (ref. 4), 102-104.

the borders of nations and the frontline of war, I do not see that he claimed to have had in mind the proposal, as Jungk had formulated it for him, "that he and his group would do everything in their power to impede the construction of a weapon if the other side would consent to do likewise."[8]

There were, of course, powerful contemporary resonances. *Brighter than a thousand suns* was published in West Germany just as a recognized nuclear hawk was moving into the position of defense minister. I suspect that when Heisenberg wrote to Jungk about the physicists' possibilities for influence, his present-day concerns shaped his historical formulations. Then after the Göttingen Manifesto of spring 1957, when the leading nuclear scientists spoke out against the nuclear arming of the West German military, activists would use the scientists' supposed wartime resistance to undergird their contemporary moral authority. Jungk's picture of a conspiracy to deny bombs to Hitler certainly created heroes; the Copenhagen visit, in his telling, should confirm this. Jungk had already been cautioned about the conspiracy theory by von Weizsäcker, who also publicly distanced himself from such dramatizations. But the author had an interest in a gripping story and a penchant to exaggeration, as von Weizsäcker characterized it to Jungk himself, "as though someone were taking a red pencil to a Rembrandt to make its contours clearer." Whatever Jungk might suggest years later in his memoirs, in his reply to von Weizsäcker the journalist conceded the tendency.[9]

As Heisenberg wrote in a letter a few days afterwards, he feared that popular representations like Jungk's, however diligent and well-meaning their authors, could never quite succeed in capturing the real complications.[10] On the other hand, he provided the journalist with his comments, knowing they would be circulated far and wide. He may not have anticipated the editing they would undergo. So far as we know, however, he also did not consult with Bohr or seek his concurrence. Jungk, for his part, did not obtain a statement from that other party. The visit was now out in the open, but it was described in Jungk's words, with selected extracts from Heisenberg's, absent Bohr's point of view.

That matter came to a head with the Danish translation. In January 1958 in the newspaper *Politiken*, Niels Blædel blasted Jungk, a bit mistakenly, as an apologist for German nationalism. But he took more

8 Jungk, *Brighter* (ref. 4), 101.

9 Von Weizsäcker to Jungk, 6 Nov 1956, and Jungk to von Weizsäcker, 26 Dec 1956, von Weizsäcker papers; von Weizsäcker, *Atomenergie und Atomzeitalter: Zwölf Vorlesungen* (Frankfurt am Main, 1957), esp. 71; cf. Jungk, *Trotzdem: Mein Leben für die Zukunft* (Munich, 1993).

10 Heisenberg to Heiner Garff, 27 Jan 1957, in possession of Ekkehard Garff.

accurate aim at the author's attack on Robert Oppenheimer and objected vigorously to the account of the Copenhagen visit. As Blædel saw it, Jungk misrepresented his connections to Bohr, as he had never heard Bohr's version of the event. This Jungk had to concede in his reply: what he had gotten was one side of the story.[11]

Although the Danish translation included the extracts from Heisenberg's letter, as I read Blædel's article his main target was not Heisenberg, but Jungk. The conflict, however, could not be so neatly contained. This Heisenberg would soon come to realize. Georg Duckwitz, the German ambassador whom Heisenberg had known for some time, sent him the *Politiken* clippings with murmurs of concern. Disturbed that the book was being read as an attack on Bohr, Heisenberg did not want to think that his Danish colleagues might hold it against him. After all, he wrote to one of them, it was Jungk's account, not his own.[12] Meanwhile, the other party kept his own counsel. Approached in Princeton by a reporter, Bohr declined to comment, saying any statement he might give would be on his own terms. Later remarks by Margrethe make clear his disagreement with the book, including Heisenberg's account. Bohr even drafted a letter to Heisenberg expressing firm objections, but—as Gerald Holton has recently related—did not send it off.

Whatever the exact targets of Bohr's objections, it is clear that Heisenberg's cooperation with Jungk stirred up problems long settled. So far as I have been able to trace, Bohr made no public statement before his death in 1962. But manifestly provoked by the book, versions of his account circulated discreetly. As filtered through his listeners, these stressed Heisenberg's anticipation of German victory and his suggestions that Bohr cooperate with the Nazis. I suspect that the recounting of the Copenhagen visit was at least as damaging to their friendship as the meeting itself.

With Jungk's book, Copenhagen became a recurrent topic of public interest. Reporters, television journalists, and others began to seek out the sources. Where Jungk had seen a peace feeler gone awry, BBC producers suspected Heisenberg had been pumping Bohr for information. In his book *The virus house* of 1967, which had a great impact in its day, David Irving managed to nearly ignore the event altogether. But it was by then too familiar to neglect. Asked about Copenhagen by a tuned-in interviewer, Heisenberg reiterated his story; Irving's account, which he otherwise found factually reliable, had trouble recapturing the actors'

11 Niels Blædel, "Om tusind tyske sole og andet blændværk," *Politiken*, 10 Jan 1958, and the ensuing exchange.

12 Duckwitz to Heisenberg, 10 Jan 1958 and 21 Jan 1958; Heisenberg to Niels Arley, 19 Apr 1958, Werner-Heisenberg-Archiv.

motivations, he said.[13] After Bohr's death, however, one party could not be asked. For Heisenberg, relating the events gradually seemed to come more easily.

The younger man inevitably had the last word. His memoirs, published in 1969, were in some ways the most diffuse of his accounts of Copenhagen. Merging together considerations over many years of war, he highlighted the possibilities of principle and the enormous difficulties of practice, their consequences for the physicists' influence, the concern of his circle about developments in America, and a desire to hear Bohr's view of the proper course. But Bohr, alarmed by the bomb's possibility in principle, had not followed the further implications, so Heisenberg now wrote. Perhaps embittered by the German occupation, his colleague had not seen the potential, Heisenberg still suspected, for an international understanding of the sort he had imagined.[14]

This was Heisenberg's final attempt to tell his version of the story, now triangulating amongst all the other narrators. What he meant to convey is still a matter of debate. So far as I can guess, I have tried to make it clear. But Heisenberg could leave so many things open as to drive a historian to despair. One last clue to his intent that I find in his papers is a letter to an acquaintance who wrote with admiration for his decision not to build a bomb for Hitler. She thought she had read this account in *Brighter than a thousand suns*. Heisenberg's reaction: "the fear that you have an all too favorable opinion of my activities and decisions during the war." To correct the impression he would send a copy of his memoirs. Did he get the message across? I doubt it.[15]

What happened in Copenhagen in the fall of 1941? That is not a question I have sought to answer. The faith of so many commentators, that they can determine a truth of the matter, seems to me more than optimistic. What I find impressive in Frayn's play, at least as I read it, is the willingness to leave the question unresolved. The play's effect depends also on the director and actors, particularly in the unfolding of the story and the playing of the final, crucial scene. As I read the text, however, I am struck by the willingness to imagine more than one acceptable explanation. Plays often have theses, of course. Unlike other commentators, I do not see a strong one here. Some interpretations Frayn favors more, some less, but he still leaves the question open. Historians often feel an obligation to produce a single, straightforward narrative.

13 "'Gott sei dank, wir konnten sie nicht bauen,'" *Der Spiegel*, 3 Jul 1967, 79-83.
14 Heisenberg, *Der Teil und das Ganze: Gespräche im Umkreis der Atomphysik* (Munich, 1969), 245-248; *Physics and beyond: Encounters and conversations* (New York, 1971), 180-182. The English translation is often unreliable.
15 Heisenberg to Magda von Wenz, 16 Oct 1974, Werner-Heisenberg-Archiv.

Here Frayn's circling approach has an advantage that I sometimes wish I could lay claim to.

So in a way that I still find very hard to designate, Frayn manages to convey something essential about the Copenhagen visit. I am impressed by his facility at maintaining the multiplicity of possibilities and his pure technical skill in playing the characters off one another. I would be hard-put to convey the historical freighting of the encounter in scholarly prose, without taking on a voice either didactic or trivializing. Yet Frayn's Heisenberg also seems to me quite different from the image of the man I have constructed for myself: in Frayn's Heisenberg I cannot really recognize mine. For Bohr the same may be the case for others; I cannot judge it so well. But the divergence does make me wonder: How is it that we get at some "truth" of the encounter if the individual participants are hard to recognize?

The gap may be explicable in part by the theatrical genre, the genre that enables Frayn to do what he does. But I fear that this genre, too, has its own limitations. Frayn's story must be a dramatization, to use the word that von Weizsäcker also applied to the accounts of the 1950s. In the play Heisenberg's emotions must come to the surface, somehow breaking through the postwar reserve that structured his existence through and through. But perhaps more than that, the Heisenberg here seems incompatible with the man whose deepest philosophical reflections spun out the difficulties of human communication.

Frayn's Heisenberg puts his faith in direct confrontation; he hopes that truth can be fixed in frank linguistic encounter. Yet this premise of the play ultimately strikes me as problematic: one last exploration of the alternatives in the sharpest of terms. If there is one overarching motif in Heisenberg's philosophical writing, it is not indeterminacy—far from it—but language. "Is it possible at all," he asked in a text probably composed in the months after Copenhagen, "to express something very definite in words?"[16] In the realms really that mattered, outside of physics, language was most powerful as an instrument of intersubjective communication exactly when it avoided trying to pin things down. This philosophical judgment resonates in Heisenberg's postwar accounts of Copenhagen. Could he have imagined establishing the truth of the matter by arguing it out after the fact? I am inclined to say no. Not the least of the ironies is that this philosophical stance, too, was something Heisenberg had learned best from Bohr.

16 Werner Heisenberg, *Ordnung der Wirklichkeit* (Munich, 1989), 38.

Postscript upon the release of Bohr documents in February 2002

What happened in Copenhagen in the fall of 1941? My colleagues still disagree, probably more sharply than ever. To my mind, the new documents from Bohr's papers do not offer too many surprises. They let us add, however, to add to the account of the post-facto discussions—and make it clear how essential the post-facto discussions are for interpreting the new documents.

The initial provocation, it is now confirmed, was the 1957 appearance in Danish of Robert Jungk's book. Bohr began his first draft to Heisenberg with the direct remark: "I think that I owe it to you to tell you that I am greatly amazed to see how much your memory has deceived you in your letter to the author of the book, excerpts of which are printed in the Danish edition" (Doc. 1). In the later drafts, too, the book remained a concern. As the years progressed, new issues were added, as the availability of Jungk's account provoked other sorts of questions. And Bohr made plain his disagreements with the story in the book. Rather than hopes for international understanding camouflaged by public praise for Wehrmacht successes, Bohr underlined Heisenberg's emphatic statements foreseeing German victory in conjunction with suggestions that the Danes cooperate with the Nazis. He stressed Heisenberg's remarks about the advances of the German nuclear project and his own active participation in it. And he firmly rejected the possibility, so he put it in one draft, that his colleague might have hinted "that the German physicists would do all they could to prevent such an application of atomic science" (Doc. 11a/b).

Bohr was emphatic that he remembered what had happened. Yet his response was part of a postwar story, too. The documents suggest, subtly but in a number of spots, that Bohr, like most everyone else, could not but read his colleague's words through Jungk's. Thus he corrected, so he thought, Heisenberg's commentary on his stunned reaction to the 1941 news. He took Heisenberg as suggesting that the cause of his shock was the realization that the bomb was technically possible. Bohr insisted it was instead the frightening prospect that the Germans were pushing ahead with full speed, then seeking a source for Heisenberg's supposed misperception in "the great tension" (Doc. 1) in his mind. The *latter* account of Bohr's reaction, however—namely, shock at the prospect of a German atomic bomb—was *already* what Heisenberg had written. He knew that he had left Bohr with the impression that he wanted to inform him about Germany's progress towards a weapon. The former notion, that Bohr had questioned the bomb's technical possibility, was instead what *Jungk* had implied. But the two accounts got amalgamated. Even more central was the crucial suggestion that Heisenberg had intended to hint that to prevent a military application

of fission he and his colleagues "would do all they could" (Doc. 11a/b). That this was not in Heisenberg's letter, I argued earlier. The suggestion, however, was present in Jungk's text. In fact, it was present in nearly those words.[17]

I am sure my colleagues will disagree about this, too. My larger point is that the documents must be handled with interpretative care and conscious sensitivity to language. If we want to compare Heisenberg's depictions with Bohr's, we have to be cautious with straightforward assertions about what each is saying. And there remains a lot we do not understand. We do not yet know the process behind Bohr's revisions. There is more to be said about the postwar context, including the occasions that led Bohr to frame his later drafts.[18] And along with never-sent letters, the two men also had other channels of communication that left few traces, both personal contacts and mediators like Duckwitz.

In the absence of startling new evidence, different answers are still possible: What happened in Copenhagen in the fall of 1941? As I read the new documents, they mostly confirm what we suspected of Bohr's view already. In that sense, I think the release has little effect on Frayn's play. I think our options remain open, and I like the play for it.[19] Yet Frayn personally, as he has engaged with historians, seems to have moved in the direction of pinning things down. With critics taking him as too sympathetic to Heisenberg, he has tried to argue the historical plausibility of *his* Heisenberg's case. Yet if he describes his play as Heisenberg's chance to defend himself, he overlooks the physicist's own choices after the war.[20] I might even say Frayn blurs his play's point. The play is stronger as drama than its author is as a historian, and I would rather leave open the questions he now seems more willing to close.

17 Robert Jungk, *Stærkere end tusind sole: Atomforskernes skæbne* (Copenhagen, 1957), 94.

18 Finn Aaserud, "The Bohr-Heisenberg meeting from a distance," talk at the Washington symposium, 2 Mar 2002, <http://web.gc.cuny.edu/ashp/nml/artsci/aaserud.html>; Cathryn Carson, "Der unsichtbare Dritte," *Frankfurter Allgemeine Zeitung*, 22 Feb 2002.

19 Note added August 2003: This applies equally to the newly released letter from Heisenberg to his wife, written from Copenhagen itself. The document gives insight into Heisenberg's state of mind, but it is no definitive account either, needing to be read against the whole freighted backdrop of Heisenberg's wartime experiences and his relationship with his wife. What I take from it, above all, is the complexity of the Bohr-Heisenberg friendship; for more thoughts, see Cathryn Carson, "Placing Frayn's play in the historical tradition," talk at the Copenhagen symposium, 22 Sep 2001, <http://www.nbi.dk/NBA/files/sem/symp/carson.html>.

20 Michael Frayn, "Ich gab Heisenberg die Chance, sich zu verteidigen," *Frankfurter Allgemeine Zeitung*, 18 Feb 2002.

Cover photographs: Niels Bohr, Margrethe Bohr (Courtesy of the Niels Bohr Archive, Copenhagen), Werner Heisenberg (Courtesy of the Werner Heisenberg Archive, Munich)

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