

Primary Source: Farm Hall Transcripts

After the defeat of Germany in the Second World War, Britain's MI6 kidnapped ten prominent German physicists in an operation codenamed *Epsilon*. The place in Farm Hall, England, where the physicists were housed over the next months was bugged with sound recording equipment, yielding transcripts of the conversations the scientists had with each other, presumably not suspecting they were being recorded. The transcripts were declassified in 1992.

As this primary source is a transcript, there is not one author, but rather the ten participants in the transcribed conversation. These included German Scientists Otto Hahn, Werner Heisenberg, and Max von Laue. As part of Operation Epsilon, in which the allies aimed to discover how close Nazi Germany was to producing an atomic bomb, the British bugged farm hall discretely, and kept their guests from July 3, 1945 to January 3, 1946. The question of how close the Nazis were to building an atom bomb is not just a point of interest with respect to the success of the Third Reich's physicists but also a point of moral interest, because after the war the scientists had stated that they had not failed to produce a nuclear bomb because of insufficient knowledge, but rather as a matter of principle. This question is one of lasting significance in how it relates to an important question of the modern world: that of what the social obligations of what the scientist are.

The context of the excerpt from GHDI is the dropping of "Little Boy", a Uranium based atomic bomb, on Hiroshima. The reaction of the German scientists to the news of Hiroshima is one of surprise and triggers a discussion that sheds light on the central question of how close Germany came to producing the bomb. The scientists' reaction is generally accepted by historians as genuine and legitimate, without coercion on the part of the British handlers or suspicion about the possibility of being recorded on the part of the scientists.

Because the Farm Hall transcripts were not declassified until January 1992, all secondary sources come from after this date. Newspaper articles and events concerning the conversation did not appear until after 1992, as the transcript was top secret and classified until that time.

However, the scientists captured in Operation Epsilon were well-known during their lifetimes. Information already known about them can be used in conjunction with the Farm Hall transcripts to add context to the information contained therein. In the case of Werner Heisenberg, for instance, his correspondence with individuals such as Niels Bohr (another prominent quantum physicist) and Robert Jungk, a journalist who focused on issues pertaining that can be used in conjunction with the Farm Hall transcripts to theorize about his thoughts and intentions.

It should be noted that most of the research on this issue tends to give a special place to Heisenberg, or even to focus on him. This is expected, as he is the most well-known of the group. Because of the undeniability of his place within the pantheon of historical physicists, the added interest in his sensitivity to Nazi politics is understandable and probably warranted.

As expected, Google ngrams shows that the number of uses of “farm hall” sharply rises after the transcript was declassified in 1992. This source is unique on the GHDI website as it is a) a transcript of recorded conversations and b) the only source relating to science. The original language in which the conversations occurred was, of course, German. The English translations supplied by the British government were used in this research.

Annotated Bibliography

Heisenberg, Elisabeth. *Inner exile: recollections of a life with Werner Heisenberg*. Birkhauser, 1984.

This book was written before the release of the Farm Hall transcripts, but was written by the late Heisenberg's wife. She discusses her view of his character, trying to explain his development as an individual and in terms of his political beliefs. Elisabeth Heisenberg describes her husband's efforts to help endangered individuals to flee from Nazi territory.

Goldberg, Stanley, and Thomas Powers. "Declassified Files Reopen “Nazi Bomb” Debate." *Bulletin of the Atomic Scientists* 48, no. 7 (1992): 32-40.

In this article, Goldberg and Powers take the view, using quotes from the Farm Hall transcripts, that the scientists, with special attention to Heisenberg, objected morally to Germany developing a nuclear bomb and were unwilling to aid in the plan's fulfillment.

Frank, Charles. *Operation Epsilon: The Farm Hall Transcripts*. Univ of California Press, 1993.

This book contains lengthy selections of the actual transcribed recordings. Many of the conversations between the physicists indicate a certain degree of mutual hostility, with some expressing relief that Germany did not successfully develop a bomb. Weizsacker states (pp. 76-77) that the reason they failed to produce the bomb is that they did not wish to succeed, and that if they had wished to succeed, they would have done so and made Germany win the war. Heisenberg (p. 77) makes the more lukewarm claim that they had been less than enthusiastic to build the bomb, but that even if this had not been the case, the distrust of the regime for them meant that they lacked the support they would have needed to succeed had they genuinely intended to. The scientists also discuss their belief that the American program was more forward-looking, while the German scientists were under too much pressure to produce immediate results. A certain degree of insecure national pride seems quite apparent in the transcripts.

Logan, Jonathan. "The critical mass." *American Scientist* 84, no. 3 (1996): 263-277.

The title of Logan's article refers to calculations German physicists in WWII had made regarding the amount of uranium needed to successfully produce nuclear fission, the process by which an atomic explosion is created. The Farm Hall transcripts indicate that the scientists were surprised the Americans had been able to build a working atomic bomb because they had overestimated the mass of uranium needed. Some still argue that

Heisenberg's miscalculation of the amount of Uranium necessary to build a bomb was intentional. The article includes a helpful timeline of events.

Klotz, Irving. "Captives of their fantasies: the German atomic bomb scientists." *Journal of chemical education* 74, no. 2 (1997): 204.

In this article Klotz uses the Farm Hall transcripts to argue that Germany's nuclear program was quite primitive, and that the view that the scientists refrained from developing it for moral purposes is incorrect.

Rose, Paul Lawrence. *Heisenberg and the nazi atomic bomb project, 1939-1945: a study in German culture*. Univ of California Press, 1998.

This book (pp. 9-11) argues against the view, held by some, that Heisenberg had the requisite knowledge to build an atomic bomb, but chose not to use this knowledge. Heisenberg's wartime publications, Rose argues, are purposefully written in a vague way, and that the Farm Hall transcripts prove that he did not have an acute understanding of how to build an atom bomb. Rose's book is a general biography of Heisenberg, and also touches on his relations with prominent Nazis and his feelings towards the regime.

El Naschie, M. S. "Heisenberg's critical mass calculations for an explosive nuclear reaction." *Chaos, Solitons & Fractals* 11, no. 6 (2000): 987-997.

This article, more scientific than historical or sociological in nature, presents favorably the argument that Heisenberg actually did have a fairly accurate idea of the critical mass of uranium needed to produce an explosive nuclear reaction. The paper is annotated with a fond dedication to the memory of Werner Heisenberg, and thus does not hide that it takes an apologetic perspective.

Bernstein, Jeremy. "Hitler's Uranium Club—the secret recordings at Farm Hall (with introd. by D. Cassidy)." (2001).

Bernstein's book quotes from the transcripts to establish that the scientists, in particular Heisenberg, certainly knew about the murderous atrocities of the Nazi regime. For instance Heisenberg is quoted as discussing instances in which he learned of the murder and/or disappearance of prominent academics of Jewish origin or otherwise undesirable to the Nazi regime. This, coupled with the scientists' surprise at learning of the success of the American atom bomb, is suggestive against the notion that they could have built a working nuclear reactor but chose not to due to their distrust of the Nazi regime.

Bernstein explains that most of the scientists involved were not involved with the nuclear project. Otto Hahn is considered to be genuinely grateful at Germany's failure to build an atom bomb, and is quoted (p. 116) even taunting those who had worked on the project. Hahn is also quoted as feeling such a burden of guilt due to what contributions he felt he had inadvertently made to the construction of a nuclear bomb, via his work on nuclear fission (which would have been known to scientists world wide), that he contemplated suicide after learning of the use of the atomic bomb against Japan. n.b. Heisenberg, in the

quote referred to above, indicates that he tried to help the individuals in question, but was not able to do so in time, though it might be disputed whether his statements indicate he felt any particular sense of urgency.

Medawar, Jean S., and David Pyke. *Hitler's gift: the true story of the scientists expelled by the Nazi regime*. Arcade Publishing, 2001.

This book is mostly about the exodus of gifted scientists from Germany that was motivated by the harshness and antisemitism of the Nazi regime. The importance of this source to this research is in the relevance of this topic to evaluating the capability of the Nazi nuclear program. Because of the loss of so many physicists who could have contributed to the project under differing circumstances, it might be argued that the program was left crippled. In this case, the correct conclusion to draw from the Farm Hall transcripts could seem to be that the failure of Germany to develop a bomb was due to insufficient knowledge, and not moral objection. On the other hand, it could be worth looking into whether or not this would have provided Heisenberg and the other scientists with a “cover story” to explain their “failures” to the Nazi leadership.