

Did Alan Turing interrogate Konrad Zuse in Göttingen in 1947?

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Abstract

Turing and Zuse had many similar ideas. But they did not know each other, they were isolated. It was not until the end of World War II that they heard about their respective achievements. And in late summer 1947 there was a mysterious meeting in Göttingen. British scientists of the National Physical Laboratory (Teddington, London) interrogated German researchers. Participants included Arthur Porter, Alan Turing and John Womersley (England) as well as Heinz Billing, Helmut Schreyer, Alwin Walther and Konrad Zuse. This reunion is described by the memoir of the German computer pioneer Billing from the Max Planck Institute for Physics (Munich). However, In the memoirs published by Porter and Zuse the colloquium at Göttingen is not mentioned. As all the actors have died, it is difficult to verify the story. At the moment, we are still looking for further evidence.

Keywords:

Alan Turing, Konrad Zuse, Heinz Billing, National Physical Laboratory (London), Max Planck Institute of Physics (Göttingen/Munich), interrogation

1. Introduction

This paper discusses the question of an unknown potential meeting between the computer pioneers Alan Turing and Konrad Zuse. It is said to have taken place at Göttingen in 1947. Most historians of computing have no knowledge of Zuse's interrogation by Turing. So far, only one source is available which mentions this event, Heinz Billing's memoirs.

2. Computer historians have no knowledge of a meeting between Turing and Zuse

Andrew Hodges from Oxford University, who wrote a comprehensive biography on Turing, has no knowledge of a meeting between both the computer pioneers Alan Turing and Konrad Zuse (mails to the author of 5 and 14 November 2011 and personal conversations at Paderborn in January 2012). There are similar statements from Wilhelm Füßl, head of the archive of the Deutsches Museum in Munich (place of conservation of Zuse's and Billing's writings), son Horst Zuse, Berlin (mails of 4 and 5 November 2011 respectively). This also applies to Jack Copeland, co director of the Turing Archive for the History of Computing (www.alanturing.net), University of Canterbury, New Zealand (mail of 22 November 2011). The documents of the National Physical Laboratory at Teddington, London (www.npl.co.uk), are located at the UK National Archive for the History of Computing (NAHC, <http://www.chstm.manchester.ac.uk/research/nahc/>). According to James Peters of the John Rylands University Library (University of Manchester) the National Physical Laboratory section of the archive does not contain anything relating to this meeting (mail of 16 February 2012).

Turing started working at the National Physical Laboratory (NPL) in October 1945. There he designed a modern stored-program electronic digital computer called ACE (automatic computing engine). Zuse's memoir says nothing about an interview with Turing. Unfortunately, the Max Planck Institute for Physics in Munich, the NPL and King's College (Cambridge University) did not answer the author's letters.

3. Zuse's Interrogation by Turing in Göttingen in 1947

Nevertheless, it is quite likely that a meeting between Turing and Zuse took place at the Max-Planck-Gesellschaft in Göttingen in late summer 1947. English computer scientists from the NPL travelled through the British occupation zone in order to interrogate German scientists and engineers. They had invited researchers such as Heinz Billing, Helmut Theodor Schreyer, Alwin Oswald Walther and Konrad Zuse to an appointment. This had the form of a colloquium. The English participants were among others John R. Womersley, Alan M. Turing and Arthur Porter. Womersley had engaged Turing (Cambridge University) at the NPL. The Max Planck Institute for Physics (www.mpp.mpg.de) has been founded in Berlin on 1 October 1917 as Kaiser Wilhelm Institute for Physics. Its first director was Albert Einstein. In 1946 it was restored to life at Göttingen as Max Planck Institute for Physics with Werner Heisenberg as its first director, in 1958 they moved to Munich. Womersley had already participated on 16 April 1947 at the „Göttinger Physiker- und Astronomentagung“ (mail from Wilhelm Füßl of 16 November 2011). Porter then worked at the Royal Military College of Science and later on at the universities of London (Imperial College), Saskatchewan and Toronto. Porter, too, has published a memoir.



Konrad Zuse (1910–1995), © by ETH Zurich Library

Professor Heinz Billing, one of the inventors of the magnetic drum and designer of the first German sequence-controlled electronic digital computer as well as of the first German program-stored electronic digital computer, depicts the event at Göttingen in his memoir [4, page 156] and in the article „Die Göttinger Rechenmaschinen G1, G2 und G3. Aus den Kindertagen der Computer / Ein Pionier erinnert sich an die Anfänge der Entwicklung“ (MPG-Spiegel 1982, Nr. 4, page 42, Max-Planck-Gesellschaft, München). Hartmut Petzold from the Deutsches Museum comments that Billing does not refer to Helmut Schreyer. Petzold thinks that the name of Turing might be an error [2, page 88]. Petzold justifies his assumption declaring that Andrew Hodges excluded Turing's attendance during a talk in Munich on 23 November 1947. But Hodges did no more insist in his former statement in November 2011 and January 2012.

4. Report of the eyewitness Heinz Billing of the Munich Max Planck Institute

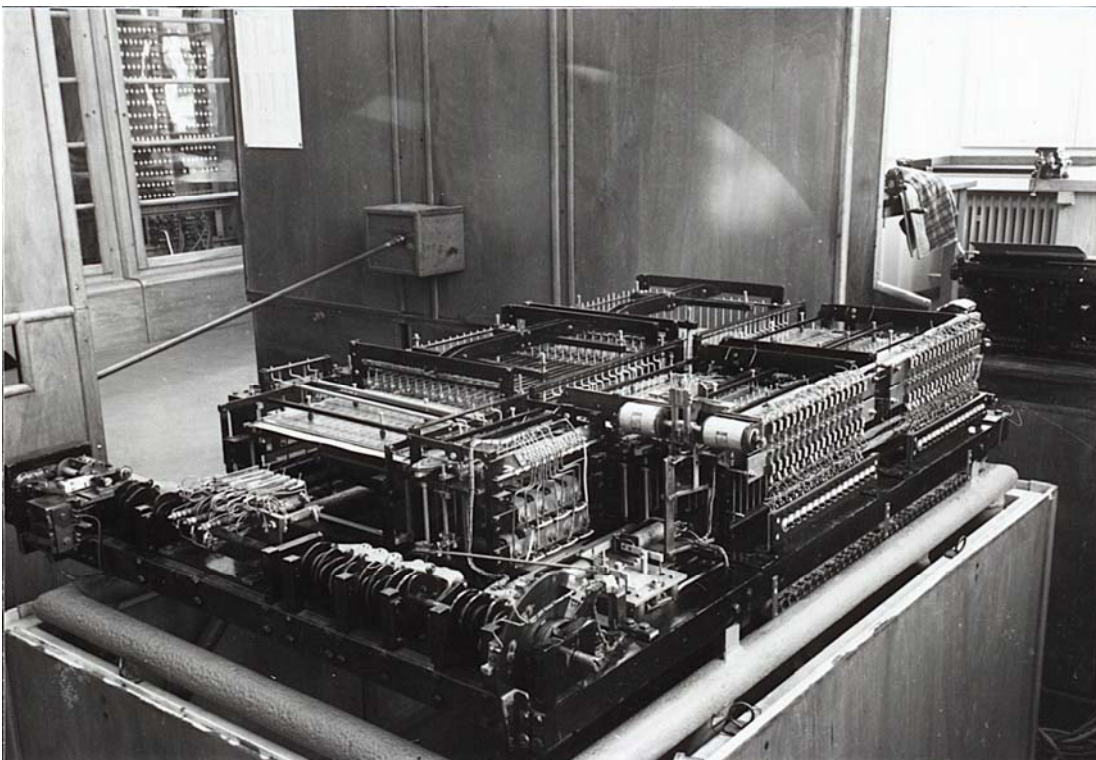
„Zu dieser Zeit bereiste eine Gruppe englischer Computer-Fachleute aus Teddington – darunter Alan Turing, Womersley und A. Porter – die britische Besatzungszone, um zu erkunden, ob es für sie in Deutschland etwas Neues zu erfahren gäbe. Die für sie interessantesten Leute hatte man nach Göttingen eingeladen. Da sich die Sitten im Jahr 1947 gegenüber den deutschen Wissenschaftlern

schon erheblich gebessert hatten, geschah die Befragung in der feineren Art eines kleinen Kolloquiums, zu dem eine Handvoll Göttinger Fachleute eingeladen worden waren, darunter auch ich. Die interessanten Deutschen, die dort Vorträge hielten, waren Prof. Alwin Walther, der an der TH Darmstadt sich eingehend mit Hollerith-Maschinen und Differentialanalysatoren beschäftigt hatte, und Konrad Zuse mit seinen Relaisrechnern. Wenn auch noch Prof. Friedrich Willers aus Dresden dabeigewesen wäre, hätte man damit die während des Krieges aktiven deutschen Spitzenkräfte für die Entwicklung programmgesteuerter Rechenmaschinen bereits vollständig gehabt. Aber Willers war ja in der sowjetischen Besatzungszone und daher für die Engländer wohl nicht greifbar“.

In English: In those days a group of English computer specialists from Teddington – including Alan Turing, Womersley and A. Porter – was travelling through the British occupation zone in order to investigate whether they could learn something new in Germany. The persons interesting for them had been invited to Göttingen. As the behaviour towards German scientists had already improved considerably in 1947, the interrogation had the more elegant form of a small colloquium. A handful of German specialists from Göttingen had been invited among them also myself. The significant German people who there gave talks were Professor Alwin Walther who had been thoroughly concerned with Hollerith machines and differential analyzers at the Darmstadt Institute of Technology, and Konrad Zuse with his relay calculators. If in addition Professor Friedrich Willers from Dresden had also participated, all leading German scientists who have been busy during the war in the development of sequence controlled calculating machines would have been there. Though Willers was in the Soviet occupation zone and therefore probably not available for the Britons.

For details see: Herbert Bruderer [1, pages 64–66].

Zuse's presence at Göttingen is confirmed by the following sentence: „Zuse hatte ich, wie früher berichtet, bereits 1947 bei der Befragung durch die Engländer kennengelernt“ [4, page 84]: As reported earlier, I had known Zuse as early as in 1947 during the interrogation by the English.



Mechanical memory of Zuse's relay calculator Z4 (in operation at the Swiss Federal Institute of Technology, Zurich from 1950 to 1955), © by ETH Zurich Library

5. Porter's visit to Göttingen

Porter tells in his memoir about a three-week journey to Germany: „ A fitting climax to my war time activities was my visit to Germany in March 1946“ [5, page 140]. And: „To counter the threat of forceful removal of German nationals across the Soviet boundaries, the authorities recruited a group of scientists from Britain to investigate the situation and in particular to identify key German personnel who were targets. I was approached by Professor Blackett, who was organizing the operation, to ascertain whether I would be interested. I agreed to serve for a period of three weeks. Although not mandatory, for security reasons, I opted to wear an officer’s uniform during the visit. My headquarters was in the university city of Göttingen. The German authorities were extremely helpful. They were as anxious as we were to ensure that German citizens were protected. One of the most memorable occasions during my stay was my lunch at the University of Göttingen Faculty Club with Dr. Werner Heisenberg, director of the Max Planck Institute for Physics and winner of the Nobel Prize in 1932. He was one of the most renowned scientists of the 20th century being one of the founders of quantum theory and discoverer the Heisenberg Uncertainty Principle. I told him about my work at Manchester and how his work had had such a profound influence. It was a very worthwhile meeting. Heisenberg was anxious to do everything possible to expedite our mission.“ [5, page 141].

Porter started work at the NPL on 1 April 1946 [5, page 143].. He left this scientific research establishment a few months later to become a full professor and head of the Faculty of Instrument Technology at the Military College of Science, Shrivenham, Berkshire. His first course there began on 1 October 1946 [5, page 147]. Porter’s successor was Turing [5, pages 145 and 157]. However, Turing took up his job at the NPL as early as in October 1945. There seems to be a contradiction. In February 1945, both John Womersley, head of the mathematics division of NPL, and Arthur Porter were in North and South America [5, pages 131 ff.].

6. Zuse’s interrogation in England

A correspondence conserved at the Deutsches Museum shows that Zuse and Schreyer together visited the National Physical Laboratory in London. They remained for three weeks in England from 15 February to 4 March 1948. However, it is unknown whether they encountered Turing on this occasion. 1947/1948 Turing spent a sabbatical year at Cambridge University. Instead of returning to National Physical Laboratory, Turing had accepted an appointment by Manchester University on 28 May and resigned from NPL. However, he finished a report for the the NPL in August 1948. By October 1948 Turing was in Manchester.

In his memoir [6, page 101] Zuse notes that in 1948 he was invited to London for an interrogation of German scientists. Moreover, he narrates: „Etwa zur selben Zeit [um 1945] hatten die Engländer in Göttingen von einem mysteriösen Rechenggerät erfahren. Erste einschlägige Berichte aus den USA hatten den Computer plötzlich ins Gespräch gebracht, und man gab sich die grösste Mühe, meine Spur zu verfolgen – ohne Erfolg.“ [6, page 88]. About at the same time [by 1945] the British learned about a mysterious calculator in Göttingen. Relevant reports from the United States suddenly became a topic of conversation and they tried very hard to get on my track – without any success. Zuse had hidden the Z4 (then still named V4, Versuchsmodell 4, prototype 4) in Southern Germany (Bavaria).

7. Turing’s visits to Germany

Turing travelled several times to Germany. Andrew Hodges’ biography [3, page 89] contains only one reference to Göttingen: „After the degree day [19 June 1934] he took a cycling trip to Germany, asking an acquaintance, Denis Williams, to come with him.“ He continues: „They took their bicycles on the train as far as Cologne, and then did thirty miles or so a day. One purpose of the trip was to visit Göttingen, where Alan consulted some authority, presumably in connection with the Central Limit Theorem“.

8. Conclusions

Billing's eyewitness report seems to prove that Turing and Zuse met in Göttingen in late summer 1947. It is strange that there is so much secrecy about this incident which is almost unknown even to computer historians. Neither Zuse nor Porter seemed to recollect the meeting. There might be various reasons:

- Possibly, the unilateral interrogation by the British was humiliating for the ingenious German inventor Konrad Zuse. It is said that he never liked the spying of the Allies (FIAT reports, field information agency technical review of German science). Undoubtedly, the participation at the colloquium of Göttingen was not optional. Unlike Billing and Schreyer, Zuse was, to our knowledge, not a member of the Nazi Party..
- At that time, Zuse was not well known in Britain. For Porter it was not worth speaking of this specific reunion. For there were numerous such interviews.
- Memoirs always consist of a personal selection of adventures. They are never comprehensive.
- Perhaps, the authors quite simply forgot these consultations.
- Maybe Billing's memoir is not reliable enough. Such stories are often recorded many decades after the happenings. So mistakes are often inevitable.

Obviously, there were different events at Göttingen. Porter went to Germany in March 1946 in order to find out about leading scientists and prevent their kidnapping and smuggling into the Soviet zone. Billing reports of a colloquium which took place in late summer 1947. It is supposed that these visits and conversations were independent of each other. The author welcomes additional information on the mysterious meeting between Turing and Zuse. Whether Alan Turing actually interrogated Konrad Zuse remains an unsolvable Entscheidungsproblem.

Acknowledgements

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References

[1] Bruderer, Herbert (2012): Konrad Zuse und die Schweiz. Wer hat den Computer erfunden? Charles Babbage, Alan Turing und John von Neumann. Frühgeschichte der Informatik. Bibliografie zur weltweiten Informatikgeschichte. Relaisrechner Zuse Z4 an der ETH Zürich. Zuse-Rechenlocher M9 für die Schweizer

- Remington Rand. Zeitzeugenbericht zur Z4. Verzeichnis der Zeitzeugen und der Arbeiten mit der Z4. Röhrenrechner ERMETH und Transistorrechner Cora, Oldenbourg-Verlag, München, XXVI, 224 pages
- [2] Hellige, Hans Dieter (2004) (ed.): Geschichten der Informatik. Visionen, Paradigmen, Leitmotive, Springer-Verlag, Berlin/Heidelberg, XII, 514 pages
- [3] Hodges, Andrew (1983): Alan Turing: the enigma, Simon and Schuster, New York, 587 pages
- [4] Jänike, Johannes; Genser, Friedrich (1997) (Hrsg.): Ein Leben zwischen Forschung und Praxis – Heinz Billing, Selbstverlag Friedrich Genser, Düsseldorf, XIV, 257 pages (series: Die Vergangenheit der Zukunft), Lebenserinnerungen
- [5] Porter, Arthur (2004): So many hills to climb. My journey as a computer pioneer, Beckham Publications, Silver Spring, Maryland, 420 pages
- [6] Zuse, Konrad (2010): Der Computer – Mein Lebenswerk, Springer-Verlag, Berlin/Heidelberg, 5th edition, XV, 218 pages