

Hans Wußing (1927-2011) and the blooming of the history of mathematics and sciences in the German Democratic Republic – a biographical essay



Hans Wußing

1. Preliminary remarks

Hans Wußing, born 15 October 1927 in Waldheim in Saxony and passed away 26 April 2011 in Leipzig, was the most influential and most versatile historian of science in East Germany, the German Democratic Republic (GDR), which perished in 1989/90. In the historiography of mathematics Wußing's name will survive for instance with his seminal work on the genesis of the modern notion of a group.

Wußing was a first-rank institution builder for our subject. That Wußing, the trained mathematician, would also promote the establishment of the historiography of the natural sciences, corresponded well with the intentions of Marxist theories, which stressed the broader social context of the basic sciences. However, several of Wußing's great non-Marxist predecessors among the historians of science and medicine, such as George Sarton and Karl Sudhoff, had entertained similarly broad interests and perspectives. And many fights which Wußing waged for the historiography of science and mathematics in the GDR existed in similar form in western countries as well. The specific and permanent problems of the institutionalization of our subjects within the classical canon of disciplines are well known.

Nevertheless, Wußing's actions for his subject can be fully appreciated and understood only against the backdrop of the special political conditions of the East European countries after World War II, and, in particular, in the context of the often strained relations between the GDR and the West German Federal Republik (BRD). Therefore this article has to go in some

detail into political developments in the GDR. Wußing's key role within GDR historiography of mathematics and science makes it problematic to list in the manner of a traditional obituary the merits of the deceased, although all the basic biographical details will be provided.

I therefore choose the form of a biographical essay and subdivide it like an ordinary scholarly article. Two decades after the end of the GDR and after Wußing's main period of activity and influence it should be possible to undertake a first attempt at describing the political conditions under which the historiography of mathematics and science was done in East Germany. A more objective account, one which would be based more on yet to be uncovered archival material and would rely less on witness reports remains a desideratum for the future.

Several difficult historical questions¹ which should be discussed in such a future account can only be hinted at in the present paper. In the following I will try to present the particular stimuli for historiography in East Germany as well as the political restrictions which hampered it. On the personal level this created good prospects for scientific careers, but it also implied inescapable compromises which Wußing had to make under strongly regulated political conditions, as had to be made by most other East German scholars as well.²

With respect to Wußing's publications I refer to his bibliography which has been published in several parts at various places, in particular in the journal NTM, edited by him during three decades.³ In an appendix I give a list of theses in the history of mathematics (possibly not fully complete) which were supervised by Wußing.

I base my contribution partly on previous reports on the period. Most important is the interview, published in German, which Wußing gave his long-standing collaborator Karl-Heinz Schlote in 1999 ([Schlote, 1999], henceforth "Interview"). Numerous details of the development of the historiography of science in the GDR which are described there cannot be repeated here. Some of them, such as the ones which concern the "advisory council for the history of science" ("Beirat für Wissenschaftsgeschichte")⁴ of the GDR ministry for universities, are probably less interesting today.

¹ Among these questions figure the role of the "Academy of Naturalists (Akademie der Naturforscher Leopoldina)" in the GDR and the enticement ("Abwerbung") of academics towards West Germany, the latter in particular in connection with their participation at workshops in West German Oberwolfach. For some archival-based attempts at historical reflection on the GDR historiography of mathematics and science see [Siegmond-Schultze, 1993, 1996, 1999].

² I have to clearly include myself in this respect.

³ See in particular [Ilgauds, 1987]. Menso Folkerts (Munich) is about to publish an obituary in "Archives internationales d'histoire des sciences" which includes a full bibliography of Hans Wußing's works.

⁴ The files of the Beirat are now deposited at the University Archives at Leipzig.

I am obliged to former East German colleagues, above all Karl-Heinz Schlote, Renate Tobies, Walter Purkert, Peter Schreiber and Wolfgang Eccarius, as well as to the Munich historian of mathematics, Menso Folkerts.⁵ They provided information and offered opinions which sometimes differed from my own. Several colleagues from the West, among them Folkerts,⁶ had personal contact with Wußing before 1989. Folkerts helped him immensely in the last years of his illness, as Schlote did too. Above all I have to thank Hans Wußing's widow Gerlinde, who in emails and talks shared her memories with me. Gerlinde Wußing's key role in Wußing's life will be clear from what follows in this article. Her support included the daily procurement of literature for her husband during his last years when he was restricted in his mobility.

Personally I got to know Wußing around 1975, when I began under him my three year "research study" ("Forschungsstudium") aiming at a "dissertation A" (Ph.D.) in the history of mathematics. After 1978 we met but occasionally. We had, however, regular correspondence, a form of communication that Wußing cultivated in a today largely unknown perfection and reliability, with good handwriting. Others of his students⁷ and colleagues knew him probably better than I did, although, apparently, none of them had a very close personal relationship with him. Inasmuch as my own experiences will allow to better describe and to understand the situation of the historiography of mathematics and the sciences in the GDR and the working conditions of Wußing, the present article will necessarily bear some autobiographical traits, although I will try to restrict these to footnotes. I also want to stress that I can principally speak for only myself and express my own opinions. I cannot rule out that my personal experiences in the GDR and in the time thereafter will colour the report. Although I was unemployed for several years after the political turn of 1989 I have finally found my way back into an academic employment while the careers of some other former East Germans were interrupted more severely, with problems of age playing a role too. It is therefore perfectly possible that I look at the failed socialist experiment in the GDR more critically than others, although I will certainly try to stick to the "facts."

⁵ Further information in detail has been provided by Hannelore Bernhardt, Sonja Brentjes, Erhard Scholz, David Rowe, Christoph Scriba, and by Ingrid Kästner, long-standing historian of medicine at the Karl Sudhoff Institute in Leipzig.

⁶ Particularly relevant for the theme of this article as well as a connecting point for future research is Folkert's talk, given at the Leopoldina in 2011, where he presents the Nachlässe of two other leading German historians of mathematics, J.E.Hofmann and K.-R- Biermann, who will play a certain role in this article. Cf. [Folkerts, 2011].

⁷ In the following I call "students" of Hans Wußing all those, whose theses A (Ph.D.) or B (habilitation) were passed under him, i.e. basically those who are mentioned in the Appendix. "Closer students" I call the following five, who, in addition, worked under him for a considerable period of time at the Sudhoff Institute. These five include Sonja Brentjes, Walter Purkert, Karl-Heinz Schlote, Renate Tobies and the author of this article.

The three most important political and biographical circumstances which shaped Wußing's life and career in the GDR were the political reform of the university system after the Second World War, the existence of the Berlin Wall between 1961 and 1989 (which was of course crucial for all Germans), and Wußing's relationship to physicist and historian of science Gerhard Harig (1902-1966). The latter was from 1951 to 1957 the first state secretary for universities in the GDR and then became the director of the traditional and internationally exemplary "Karl-Sudhoff-Institut für Geschichte der Medizin und der Naturwissenschaften" (founded 1906, under this name since 1938) at Leipzig University. In 1957, Wußing became the first, and for several years only, close collaborator of Harig's which opened to him many opportunities for personal development and future influence. The importance which the historiography of science attained in the GDR in research and teaching is undoubtedly related to Harig's connections to East Berlin and to his lasting influence there even after his early death in 1966. In view of the present cuts to the German university system,⁸ at least for special and "exotic" subjects, and the threat to or cancellation of the chairs for the historiography of the sciences and mathematics in Munich and Hamburg, some historians of science might be tempted to say that there was a "blooming" in West German teaching and research in these subjects too, which has faded now as well. Indeed there are some interesting parallels⁹ in the East- and West German processes of institutionalisation and cutting back of our field, which, however, I will leave to the judgment of my colleagues socialised in the West.¹⁰

This essay will hopefully be able to at least indicate that there remain even today positive effects of the 30 years of a culture of the historiography of science and mathematics under Hans Wußing.

⁸ Somewhat different is the situation with respect to the Max Planck Society, whose well equipped institute for the history of science in Berlin, however, cultivates the history of mathematics only to a lesser extent.

⁹ In a very broad sense one could consider Joseph Ehrenfried Hofmann (1900-1973) as a West German figure parallel to Harig. Unlike Harig, however, Hofmann was a pure historian of mathematics and an "internalist" in the field. The noted Leibniz scholar and founder of the conferences for history of mathematics at Oberwolfach remained during his entire life a high school teacher in small Ichenhausen. As late as in the Oberwolfach conference report of 1965, he complained that there did not exist chairs for history of mathematics in Germany and that this would make the training of young scholars in the field almost impossible. In the report for 1966, however, he mentioned the "habilitation" in history of mathematics of both Scriba (Hamburg) and Wußing (Leipzig). Hofmann's student Christoph Scriba (b. 1929), whose career as the first ordinary university professor for history of science in West Germany has a certain similarity to that of Wußing, continued Hofmann's tradition in organising the conferences in Oberwolfach.

¹⁰ This concerns also judgment of parallel, if very different processes of political adaption in West Germany, in particular with respect to the Western occupational powers and the role of the old elites from the Nazi system.

2. The political reform of the University of Leipzig, the role of Gerhard Harig and Wußing's first years as an academic (1947-1957)

The University of Leipzig was founded in 1409 and is one of the oldest universities in Germany. In 1953, with state-secretary Harig attending, the university was renamed Karl-Marx-Universität although Marx had no biographical connection to Leipzig. Particularly in the 1950s, this university was a place of vivid political and social conflicts which were carefully watched both in East and West Germany. Partly due to these conflicts, partly due to the better opportunities for careers and salaries in West Germany, some prominent and politically conservative mathematicians and scientists, such as the mathematicians Erich Kaehler (1906-2000) and Ernst Hölder (1901-1990), left the GDR. But also some scholars who had originally assumed a positive attitude towards the political system of the GDR were forced to go. Among them were the philosopher Ernst Bloch (1885-1977) and Germanist Hans Mayer (1907-2001), both of whom returned from American exile during the Nazi years. The erection of the "Berlin Wall" in August 1961 put an end to regular personal traffic between East and West Germany; relations could only be fully recovered after the fall of the Wall in 1989.¹¹

Shortly after the War and after his liberation from seven years incarceration in Buchenwald, the Nazi concentration camp near Weimar, even before he became state secretary, Harig played a prominent political role at the University of Leipzig. Harig, who, according to Gerlinde Wußing, preferred above all else to sit at his desk and do research, had to take on, and along with a professorship for Marxist philosophy, a multitude of political functions, which severely hindered his engagement in research.¹²

It was in my opinion unfortunate, even tragic, above all for the younger generation in the GDR, that former emigrants like Harig never spoke out publicly about the darker points of the history of communism which many of them had experienced personally. The communist Harig had been arrested by the Soviet security service in 1937 and was deported to Nazi Germany in 1938. Public silence about these facts contributed to poisoning the political

¹¹ The Wall was, on the one hand, a desperate attempt at neutralizing the economic superiority and cultural attractiveness of West Germany. On the other hand, not least due to humanistic concerns and above all because of the loss of human lives, the Wall was principally problematic and became less and less rationally defensible in the following decades. As an historian I have bad conscience to restrict – due to lack of space and the main topic of this article – my commentary on the complicated phenomenon of the Berlin Wall to two sentences.

¹² For Harig's activities immediately after the war see the recent brochure [Caysa/Seidel/Wittich, 2004]. Even in an unfriendly, if apparently well informed article, which appeared in June 1952 in the West German weekly "Der Spiegel" Harig was called a "trusting Saxonian" ("biederer Sachse") who did not have "much of a say" ("nicht viel zu sagen") in the state secretariat which he was supposed to lead and that he was there monitored by political hardliners. [Anon., 1952]. Online under <http://www.spiegel.de/spiegel/print/d-21977144.html>.

atmosphere in the GDR and was a particular obstacle to historical research.¹³ It seems also quite possible that personal experiences were a reason that Harig abstained from discussing the historiographical work of his Russian colleague, Boris Hessen (1883-1938), who had been shot by the Soviet secret police [Wittich, 2004, 99-100]. As is well known, Hessen's talk "On the social and economic roots of Newton's 'Principia'" at the London International Congress for the History of Science in 1931 had exerted influence and triggered considerable international discussion, and not just among the Marxist of the historians of science who attended that congress.

In 1947, the year when Harig assumed his professorship, Wußing and his future wife Gerlinde began studying mathematics and physics at Leipzig University. They both wanted to become teachers. Wußing's registration for mathematics as a major subject was due to a bureaucratic error; he had actually applied for chemistry as a major and physics and mathematics as minor subjects (Interview, p.73). However, both Hans and Gerlinde were lucky to have been accepted as students at all. Both were of "bourgeois origin" ("bürgerlicher Herkunft") as it was called at the time – Hans' father was a business employee, Gerlinde's parents were teachers. Under the conditions of the reform of the educational system in East Germany their acceptance as students was far from natural and was probably due to their outstanding grades in their high school diplomas. Hans Wußing had had to interrupt his high school education during the war. As a 15 year old he became an air force auxiliary in 1942; at just 17 years of age he was drafted for the regular army. After being prisoner of war under the British in Belgium and under mournful circumstances, half frozen and half starved to death, Wußing reached his birthplace Waldheim in East German Saxony in 1946 and continued his school education. Also Gerlinde, who passed her high school diploma together with him in 1947, had experienced for herself - as a resettled person from the former Sudetes in Czechoslovakia - the existential consequences of the war. Both Hans and Gerlinde, as so many Germans at the time in East and West, hated war and Fascism and hoped for a principally renewed society, which would be structurally unable to produce another war. In this hope the couple was supported by antifascist teachers in Waldheim and, later, by former emigrants and Nazi victims whom they met in Leipzig.

In June 1947, before going to Leipzig, Hans and Gerlinde became members of the "Socialist Unity Party" (Sozialistische Einheitspartei Deutschlands, SED), which had been founded in 1946, in which the traditions and individuals of the former Communist Party

¹³ It is not important in this context that one often knew about these things through the grapevine. I myself, for one, was long familiar with Harig's fate. I am talking here about the lack of public discussion.

dominated. Gradually, but particularly after the foundation of the GDR in 1949, SED functionaries assumed the decisive positions at the University of Leipzig. In the same year 1949 there was established a “Workers- and Peasants Faculty” (Arbeiter-und-Bauern Fakultät, ABF) at the university, which had existed since 1946 in the form of a so-called “pre-school” and was destined to give children from traditionally disadvantaged strata of society preferential access to university studies and prepare them for the traditional academic subjects. Here Gerlinde became in 1951 – even before she and Hans had finished their teacher training in 1952 – a “dozent”. She taught there for 11 years until the ABF was dismantled in 1962, having fulfilled its historical mission. Later, Gerlinde took her doctor degree with a didactical topic at the mathematical institute of the university and was engaged in the training of mathematics teachers. Their daughter Petra, born in 1953, also took a considerable part of the couple’s energy. Hans helped in looking after their only child. The bulk of housework, however, he left in traditional manner to his wife.

3. Wußing’s encounter with mathematics and its history

Before he came to the history of mathematics, Wußing had caught fire for mathematics itself. The book of “B.L. van der Waerden ‘Moderne Algebra’ (1930) was like a revelation” (Interview 73). In 1952 Wußing gathered a doctor stipend (Aspirantur) at the Mathematical Institute. He could not defend his dissertation until 1957 because he had to read it regularly to his advisor, the almost blind Walter Schnee (1885-1958). The dissertation on “Embeddings of finite groups” (“Einbettungen endlicher Gruppen”) appeared 1958 in the *Sitzungsberichte der Sächsischen Akademie der Wissenschaften* and was positively reviewed in *Mathematical Reviews* by the leading English group theorist Graham Higman (1917-2008).

In the atmosphere of the traditional Leipzig Mathematical Institute, Wußing must have become aware of the historical and political dimension of mathematics. Maybe the fact that his advisor Schnee tried throughout his life to prove the Riemann conjecture gave Wußing a first clue. Schnee and Ernst Hölder had Jewish teachers (Edmund Landau and Leon Lichtenstein), who had been expelled by the Nazis in 1933 from Göttingen and Leipzig.¹⁴ Another Leipzig mathematician of the time, the number theorist Hans Salié (1902-1978), was responsible for the edition of “Poggendorff”, the “Bibliographisch-literarisches Handwörterbuch der exakten Naturwissenschaften,” and he later supported Wußing’s

¹⁴ Some of the political information conveyed to Wußing by Leipzig mathematicians apparently remained on the level of anecdotes. In his interview of 1999 Wußing reports somewhat uncritically (p.73) that Hölder had opposed Lichtenstein’s dismissal and had therefore to give up his academic career temporarily. There is, however, no historical evidence for this claim.

habilitation on the history of the notion of mathematical group. “Poggendorff” soon became an important historiographic tool for Wußing. Its edition was finished in the early years of the new millennium. This was done under the lead of the Saxonian Academy of the Sciences and under active participation of Wußing, who had been a member of the Academy since 1984. Probably Wußing also noticed in the 1950s that a mathematician whom he admired, van der Waerden, had published “Science awakening,” which quickly appeared in German translation. Further sources which influenced Wußing’s historical interest were Tropfke’s “Geschichte der Elementarmathematik” and the “brilliant lectures on universal history” (Interview 74) given by the internationally recognized Marxist historian of the French revolution, Walter Markov (1909-1993), who in 1951 had been expelled from the SED due to “Titoism”. Finally, invited by the philosopher Ernst Bloch, Wußing gave lectures on the foundations of mathematics, which however he found “in total not very successful”. In his interview of 1999 Wußing also said that “Bloch was driven out of Leipzig under unworthy circumstances” (Interview 74).

All these broad interests on the part of Wußing did not, however, rule out a mathematical or purely scientific career. After his successful completion of the Ph.D. in 1957 Wußing almost ended up as an industrial mathematician within the GDR’s ambitious aeronautic industry which had been started in Dresden in 1954 (Interview 76). However, even the prospect of a, for the time, overwhelming salary and many privileges did not let him overlook the one-sidedness of a future job as a calculator of the differential equations of wing flutter. The GDR airplane industry was shut down in 1961 for political and economic reasons. Thus Wußing’s decision proved the right one in retrospect.

But above all, in 1957, new concrete alternatives for a career in the academic realm opened up for Wußing.

4. Wußing’s entry into the Sudhoff Institute and the influence of Harig

Gerhard Harig’s sister, Annemarie Harig, was director at the ABF where Gerlinde worked and Hans Wußing himself taught for two years. Annemarie had informed Wußing in 1957 that Harig was about to return from East Berlin to Leipzig. Harig planned to take over the Sudhoff Institute at which, since 1951, he had assumed the formal position as professor for history of science in addition to his real job as state secretary for the universities. Wußing was informed that there was the possibility to apply for a job at the Sudhoff Institute and to take the second academic degree there, the ‘habilitation,’ at a later point of time. There is no doubt that Wußing owed the following important step in his career to certain coincidental circumstances such as the lack of better qualified candidates, and also to personal contacts and his

membership of the SED party. It would be foolish however, to construct a reproach against Wußing from these facts.¹⁵ There are indications that Harig appreciated his future successor as a man and a scholar but that he felt personally and politically closer to other students.¹⁶ This could be explained by the assumption that the physicist and Marxist Harig found the internal history of mathematics somewhat scary and less amenable to Marxist analysis. In the early 1960s, when Wußing worked on his habilitation thesis which was very much internal history, Harig could of course not foresee how broadly his successor Wußing would eventually work for the history of science in all its aspects.

When Harig took over the Karl Sudhoff Institute in 1957, the history of the sciences did not exist except in the title of the institute. At that time the institute basically consisted of the outgoing director Felix Boenheim (1890-1960), the former emigrant and historian of medicine, plus one scholar in the same area and some technical personnel.¹⁷ It was only with Harig's entry into the Institute that the expansion in personnel in both historical directions (medicine and sciences/mathematics) began, which in the 1970s was paralleled by an overall expansion of the university and academy systems of the GDR. It is no coincidence that it was an institute for the history of medicine which became the nucleus for the development of the history of science in the GDR, given the strong traditions of the institutionalization of the history of medicine in Germany.¹⁸

In 1957 Harig had less than 10 years to live, but during these years he initiated important developments for history of science in the GDR. In 1960 he founded, together with the East Berlin historian of medicine, Alexander Mette (1897-1985), the journal "NTM – Schriftenreihe für Geschichte der Naturwissenschaften, Technik und Medizin" (Journal for the history of science, technology, and medicine). From 1965 this journal was regularly issued by a Leipzig publishing house, in spite of the permanent and specific problems with print capacity and paper rationing in the GDR. In 1967 Wußing followed Harig as an editor of

¹⁵ I only remark this here, because such foolish opinions about careers in the GDR exist in comparable cases. After 1989 Hans Wußing was not spared some political denunciations either.

¹⁶ Among those was Günter Wendel, who later at the Humboldt University in Berlin was my superior and vouched for me politically on many occasions. He wrote under Harig a well-documented and politically strongly pointed dissertation on the foundation of the Kaiser-Wilhelm-Society in 1911, the predecessor of today's Max-Planck-Gesellschaft [Wendel, 1975]. Political functionaries of the Berlin Academy of Sciences, the East German pendant to the MPG, forced Wendel to include into the subtitle the word "imperialist" before publishing his dissertation with the Academy's publisher. (This is documented in letters of which I have copies). Both Wendel and Wußing told me the following anecdote about Wendel's defence of his dissertation in Leipzig 1964. Harig had called the dissertation "excellent" ("vorzüglich") which caused Wußing to ironically ask the candidate whether his advisor had said "vorzieglich" ("to be preferred"), a play with a word which actually does not exist in the German language.

¹⁷[Schönau, 1996]. A thorough investigation, including the political dimension of the Sudhoff-Institute in the GDR, has been recently published by Ingrid Kästner [2011].

¹⁸ This tradition is largely based on the fact that these institutes are responsible for teaching medical terminology.

NTM, which under the managing editor and historian of chemistry at the Sudhoff Institute, Irene Strube (b. 1929), published much on the history of mathematics as well, mostly in German. After 1989/90 NTM was saved to continue in the united Germany; since 2008 the journal has been the official organ of the “Deutsche Gesellschaft für Geschichte der Medizin, Naturwissenschaften und Technik e.V.” (DGGMNT). Harig’s last substantial contribution to GDR historiography of science was the foundation of the GDR National Committee for the History of Science on the eve of the International Congress for the History of Science in 1965 in Warsaw. However, this led to a conflict with the West German historians of science. This was because West Germany insisted on its exclusive right to represent all Germans (“Alleinvertretungsanspruch” or “Hallstein-doctrine”), both West and East, at such events and consequently the West German representatives in Warsaw refused to recognize the GDR Committee. Wußing, who recalled these events in 1999, described his encounter at the Congress with a Jewish and left-leaning liberal American scholar (Interview 76/77). This American, who was affected by the still seriously war-damaged Warsaw and who knew of the anti-Fascist past of Harig¹⁹, was critical of the strong influence of the old elites in West Germany and chose to give East Germany his support. As a result the GDR Committee was awarded international recognition at the congress by a small margin.

Wußing became, as we shall see in more detail later, Harig’s successor as an organizer of East German historiography of science and mathematics. How much did he learn from Harig beyond that, i.e. conceptually and as a researcher?

Wußing remained loyal to his teacher in the history of science during his entire career. In his interview given to Schlote in 1999 he calls Harig the “founder in the GDR of a non-dogmatic historiography of science with Marxist orientation” (Interview 74). Even in his two-volume and popular late work “6000 Jahre Mathematik” [Wußing, 2008/2009] Wußing quotes, among other publications of Harig’s, the article [Harig, 1958]. In the latter, entitled “On the origin of the classical natural sciences in Europe” and published in the often dogmatic and sterile journal “Deutsche Zeitschrift für Philosophie,” Harig had made East German philosophers familiar with the latest results of Western research in the historiography of science. Not only scholars, close to Marxist positions, such as J.D.Bernal, S. Lilley and J.Needham, but also researchers on Scholasticism, Renaissance and modern science, such as E.J. Dijksterhuis, E.Zilsel, L.Olschki, M. Ornsten, and W.B.Parsons, are broadly presented and appreciated in this article. The Marxist interpretation which Harig occasionally adds

¹⁹ This is mentioned in [Wußing/Schreier, 2006, 56].

remains mild and barely self-righteous. One gains even the impression that Harig realizes how much his own research on this period, which he had partly done in Soviet exile during the 1930s, had lagged behind those results.²⁰ It seems evident to me that Harig passed on to Wußing much of his enthusiasm for original sources and for the work of the “bourgeois” historians of science. Wußing as the representative of the next generation of GDR historians of science had without any doubt better chances for individual development, even though even Wußing – similar to Harig – finally had to suffer the burden of relentless organisational work for his field. Harig’s Marxist positions were certainly shared by Wußing, not just in official statements such as [Wußing, 1979b], but also in detail in the way in which he presented the history of sciences and mathematics in his publications, in particular in the way he structured and periodized the history of mathematics in his text book [Wußing, 1979a].

This leads us to Wußing’s central field of historiography, the history of mathematics.

5. The beginnings of systematic teaching of the history of mathematics in the GDR and the influence of Wußing

In the early 1960s Wußing offered lectures on the history of mathematics, which originally were voluntary for students (Interview 70). For this purpose he published a textbook “Mathematics in Antiquity” in 1962.²¹ At the same time he took care of a German translation of A.P. Juschkewitsch’s “History of Mathematics in the Middle Ages” (1964), whose publication was probably facilitated by the fact that it was a “product of Soviet science” as the usual recommendation went. The representation of Arabic/Islamic mathematics in this influential book remained definitive for Wußing even in his late work [Wußing, 1, 2008/2009].

The courses for history of mathematics from the beginning of the 1960s were originally destined for future teachers of mathematics only. According to Purkert there existed a decision of the GDR ministry of popular education (Volksbildungsministerium) of 1960, which gradually led to mandatory lectures in the history of mathematics for teachers.²² This is probably why Wußing in [Dauben/Scriba, 2002] connects the stimulus for the introduction of systematic lectures on the history of mathematics for both teacher and diploma students in

²⁰ Harig’s publications are included in the bibliographies published in [Harig, 1973] and [Harig, 1983]. Gerhard Harig’s son, the historian of medicine who was born in emigration, Georg Harig (1935-1989), asked me in the beginning of the 1980s to help with the edition and partial translation from Russian of his father’s historical articles. In vain I proposed rather detailed annotations to these articles. They finally appeared largely without commentary as [Harig, 1983].

²¹ Some remarks on this textbook are given below in connection with J.E.Hofmann’s criticism of the book.

²² [Purkert, 1979, 137]. The exact source and formulation of the decision I have so far not been able to find.

mathematics in the 1970s to the so-called “Mathematics decision”²³ of the SED politbureau from December 1962. This ten-page decision, however, does not contain a single word about history²⁴ and focuses on the increase of the mathematical level of school education and on the training of mathematics teachers. The document was rather critical with respect to the existing level of teaching and proposed a wealth of measures to be taken, among them the support of mathematics olympiads (in which the GDR turned out to be rather successful in the years to come) and the gradual communication of knowledge about “modern computing machines”. The decision had even a trace of “new maths” since it mentioned set theory as a possible subject to teach at school. Also Wußing himself was involved in the movement towards the preparation of the “Mathematics decision”, a movement which showed that there was – within given limits and strategies – some public discussion possible even in the GDR. On 7 May 1960 Wußing, together with the Leipzig mathematicians J. Focke and H. Schumann, published an article in “Leipziger Volkszeitung” (the local newspaper edited by the SED party) which was entitled “Why mathematics? Mathematics in our society.” The authors criticized the “very unsatisfactory” attention which the mathematical competence of future teachers had been given by the “authorities responsible for popular education”²⁵. The article argued historically too, pointing to the fact that the history of mathematics had revealed that purely scientific theories often find “applications in practice only at a much later point of time”.

If the “Mathematics decision,” taken 18 months later, showed that in teacher education at the time there were still other priorities to be dealt with, Wußing’s recollection of the early 1960s as an important period for bringing history of mathematics to the fore seems justified nevertheless. In an unpublished 116page “Program of the State Secretariat for the further development of the field of mathematics” of 15 February 1963, the history of mathematics is expressly mentioned as one of eleven mathematical “research complexes” to be promoted. It ranks as the eleventh complex and is commented upon as follows:

“This research complex has special importance in the education and training of students and contributes considerably to a Marxist understanding of mathematics. In this field very little has been done so far. There exists no young generation in the field.

²³ [Wußing, 2002, 144]. “Mathematics decision” (“Mathematikbeschluss”) was an abbreviation for the more complete “Beschluss ... (1962)”, as given in the bibliography. [Mathematikbeschluss, 1962].

²⁴ The only, if rather vague, reference to history is the emphasis of the “problems of world view education for pupils in mathematics instruction” [Mathematikbeschluss, 1962, 148].

²⁵ This alluded to the Ministry for Popular Education (Volksbildungsministerium), which was responsible for the teacher education at universities and which was very much politically oriented. The critical article was without any doubt written in coordination with Harig and other political authorities. Thanks go to Sabine Pabst from the Archives of the Leipziger Volkszeitung for providing me with a copy of the article, which is from no. 127, p.11.

The professors of mathematics basically refuse to teach the history of mathematics, claiming to have no time or no competence. In the background there is, however, fear of a clear and unambivalent positioning.”²⁶

6. Wußing’s main work, the *The Genesis of the Abstract Group Concept* (1969)

Wußing’s contribution to the institutionalization of the historiography of mathematics and science in the GDR was unique, not least due to the central position of the Sudhoff Institute. East German research in the history of mathematics, however, had already been promoted in the 1960s by several scholars. In particular the publications by Kurt-Reinhard Biermann (1919-2002) in Berlin on the history of Berlin mathematics and on the biographies of Gauß and Alexander von Humboldt (often concerning his relations with mathematicians) have found international recognition. Unlike Wußing, the eight years older Biermann was employed at the GDR Academy of Sciences which was independent from the university system. Wußing was a member of the editorial board of *Historia Mathematica* from volume 1 (1974) until volume 17 (1990), i.e. until the end of the GDR. In the same period Biermann was the representative of the GDR in the “International Commission on the History of Mathematics,” figuring on the back cover of the same journal. The mutual relationship between the two leading East German researchers in the history of mathematics was respectful. However, due to their very different biographies and working places, and due to the much clearer political engagement of the younger, their relationship could not be very close.²⁷

The 1960s were the years of the most intense research activity in Wußing’s life. He had chosen “The Genesis of the Abstract Group Concept” as a topic for his habilitation in 1966. B.H. Neumann (1909-2002), the student of Issai Schur and German-Jewish emigré from Berlin in 1933, wrote in 1969 on the occasion of the publication of Wußing’s thesis as a book:

“The author has set out to trace the process of abstraction that led finally to the axiomatic formulation of the abstract notion of group. His main thesis, ably defended

²⁶ “Konzeption des Staatssekretariats für Hoch- und Fachschulwesen zur weiteren Entwicklung der Fachrichtung Mathematik,” Bundesarchiv Berlin, Bestand SED-Zentralkomitee, Wissenschaft, IV 2/9.04/281, fol. 97-213, fol. 120/121. Leipzig is named as a future center for the history of mathematics (“Remarks on the program” / “Bemerkungen zur Konzeption”, fol. 214). In the same program, number theory is called a discipline “which should not be further promoted,” at least within the university system (fol. 127).

²⁷ Hans Wußing was never elected a member of the Leopoldina, to which Biermann belonged from 1972. This leading Academy had politically rather strained relations with the GDR government, although it was subsidized by the state. I had a rather close relationship with Biermann from the mid-1980s both in scientific and personal respects. Maybe this was not too well received by my earlier teacher Hans Wußing. For Biermann’s biography see [Siegmond-Schultze, 1989], and recently [Schuchardt, 2010] and [Folkerts, 2011].

and well documented, is that the roots of the abstract notion of group do not lie, as frequently assumed, only in the theory of algebraic equations, but that they are also to be found in the geometry and the theory of numbers of the end of the 18th and the first half of the 19th centuries.”²⁸

As is well known the 1960s were a hightime of structural mathematics in the sense of the French group of mathematicians “Bourbaki”. The extended abstract of his habilitation thesis, which Wußing had published in 1965 in NTM, leaves no doubt that the choice of his theme had been partly motivated by his reception of the phenomenon Bourbaki and by his intense and controversial feelings about it. Wußing found among other things that “the study of sets (Gesamtheiten) where relations are defined between the elements [...] has never by itself led to group theoretic thinking, but only via the investigation of the automorphisms.” [Wußing, 2010, 3]. Although thus retrospectively sinking an abstract notion of structural mathematics, automorphisms, into history, Wußing was nevertheless primarily interested in tracing the non-axiomatic, informal sources of the abstract group concept. He thus developed a kind of counter-proposal to the way in which Bourbaki looked at the history of mathematics. It is maybe exaggerated to claim that historical reflexions of the kind of Wußing’s “Genesis” could influence the development of mathematics itself, albeit in an indirect way. It should be noted, however, that Bourbaki’s research style was also criticized within mathematics in the years to come. In any case, Wußing’s book of 1969 seems to me a good example of history which invites research mathematicians to reflect on the broader direction and meaning of their own work. The conjecture is supported when one reads the very positive reviews which the book received on its publication by mathematicians such as B.H. Neumann and by historians of mathematics such as Joseph Ehrenfried Hofmann.²⁹

With his main work for the historiography of mathematics Wußing stimulated several of his students to investigations into the history of mathematical concepts, among others on the notion of the field, on the notions of algebras, and on spaces and operators in functional analysis. In his politically partly defensive interview of 1999, Wußing alluded to the days of Hitler’s Germany, when some Germans claimed to have gone into “inner emigration” in order to avoid complicity with the regime. Given that the history of mathematical concepts did not immediately appear amenable to Marxist patterns of historiography Wußing said clearly:

²⁸ *Zentralblatt für Mathematik* 199 (1969), 291/92.

²⁹ More of Hofmann’s reaction will be discussed below in connection with Wußing’s first contacts to Oberwolfach and to Hofmann.

“In order to do ‘traditional’, ‘pure’ history of science in the GDR, it was not necessary to go into inner emigration.” (Interview 66)

7. Wußing’s Marxist methodology and his theory of science

Hans Wußing was clearly convinced of the truth and explanatory power of the Marxist view on history. In the first edition of his text book “Lectures on the history of mathematics” [Wußing, 1979a] he used an orthodox Marxist periodization of the history of mathematics which used “social formations” such as “Slavery Society”, “Feudalism,” “Capitalism”, “Monopoly Capitalism”, although he was far from trying, in a stereotypic way, to explain all or even the most important internal developments of mathematics by changes in the social formations. However, except for the relatively uncontroversial “Feudalism,” Wußing abandoned this terminology in the second edition of the book which appeared 1989, just prior to the political turn. In the preface of this second edition, written in autumn 1987, Wußing does not comment on this change in terminology, which was probably a reaction to Gorbachov’s “perestroika”. Meanwhile, so it seems, Wußing had lost faith in the “epoch of the transition from Capitalism to Socialism/Communism,” as one of the periodizations in the first edition of his lectures had implied [Wußing, 1979a, 14]. Nevertheless Wußing introduced the new preface of 1987 with Lenin’s words: “One can only become a communist by enriching one’s memory with all treasures which mankind has dug up.” [Wußing, 1979a, second edition 1989, 5]. In fact, also in the original edition of 1979 the vocabulary of “social formations” had been less dominant than notions such as “industrial revolution” and “productive forces” which continued to figure in the second edition as tokens of a Marxist view on the history of science. By strongly emphasising the notion of “scientific revolution” for the 17th century in the second edition, Wußing’s underlined his continued effort to take account of the inner-logic (internal) dimension of the history of science and mathematics.

In spite of the opportunity for historians in the GDR, as described above by Wußing, to publish on the inner-logical dimension of science, there was always political and philosophical pressure on historians of science to legitimize their subject. Moreover, Wußing’s main period of activity coincided with the international rise of “Theory of Science” and various science studies. Of course, the pressure for the history of science to legitimize itself as a discipline is not bound to political systems and exists even today.

Wußing’s occasional excursions into the theory of science have therefore to be seen against this background of pressure for legitimation. Legitimation had to be provided in three respects: vulgar Marxist attempts to explain the development of science exclusively by

societal demands, in particular those stemming from material production, had to be fended off. In order to do this, Wußing, in an article dedicated to the 100th birthday of Lenin, referred to the Russian philosopher's discussion of the "self-evolvement or self-movement of thought" [Wußing, 1970, 15]. Second, there was a need to stress the specifics of the historiography of science and mathematics in comparison to other scientific disciplines, in particular within the humanities in the GDR. Wußing succeeded in "fending off massive and ideologically motivated efforts to include the history of philosophy, the history of linguistics etc ... into our Council [for history of science; R.S.]" (Interview 71). Thirdly, Wußing had to remain independent from specialized Marxist research in the theory of science, which in the GDR was, for instance, cultivated at the institutes of the Academy of Sciences in Berlin. He would rather speak about "Marxist historiography and Marxist theory of science having independent goals and profiting from mutual support" [Wußing, 1970, 28]. In order not to remain purely negative and reactive in his efforts of legitimization, Wußing developed a "classification" or sequence of steps of the historical interaction between science and material production, an effort, however, which found almost no response from Marxist general or economic historians [Wußing, 1975, Schreier, 1993, 183].

In addition, Wußing tried to find the connection to Marxist historiography also for the inner-logical dimension of the history of science and mathematics. In one of his rare reflections on the theory of science, Wußing extended the classical logical pair of opposites "intension-extension" of a scientific concept/notion by what he called its "ostension" to a triade of conceptual dynamics. "Ostension" meant to him the entirety of social activity, both within and beyond science, and related to the historical development of a scientific concept [Wußing, 1970, 21]. The West German historian of mathematics, Erhard Scholz, who in his work was also very much inspired by Wußing's "Genesis," conjectured that Wußing's rather vague notion of "ostension" was related to a similar philosophical concept of the same name, introduced by Ernst Bloch [Scholz, 2010, 313]. As mentioned above it was this philosopher with whom Wußing had had personal contact in Leipzig in the 1950s.

Above all, Wußing was concerned not to water down or distort investigations into the history of science by sterile abstractions; in this effort he has influenced beyond any doubt his closest students as well. I have for myself experienced Wußing's skepticism in this respect, and his robust intervention was to my benefit.³⁰ Generally one has probably to admit that on

³⁰ When in June 1978 I submitted to him my supposedly finished Ph.D. dissertation on the history of functional analysis, he tore it in pieces, because it speculated at length on the dialectics of abstract and concrete analysis, while the historical part was much too short.

average East German historians of mathematics and the sciences reflected less than their Western colleagues on the theory of science. Even familiarity with, but above all the use of, the vocabulary and special notions developed in Western literature was often only possible by a detour through Marxist theory of science.³¹ Otherwise there was a danger of being accused of smuggling in non-Marxist positions.

Wußing himself said much later in 1999:

“The discussions about the change of paradigms and on the so-called ‘external’ and ‘internal’ factors for the development of science have played a huge role in the old GDR. In my opinion there has been invested much effort and intellect into a problem which – in its abstract philosophical generality I have always deemed a spurious one.”
(Interview 66)

Thus Wußing seems to mark his distance, at least for the period of the GDR, even towards the Kuhnian discussion of scientific revolutions. And yet, the second problem mentioned, the “external-internal-debate,” he made the explicit topic of a talk in 2007 on one of his last public appearances. Here Wußing also mentioned Hessen [Wußing, 2007]. It seemed the increasing distance from the GDR let Wußing look back at the old discussions in a more relaxed way.

8. The further extension of the culture of the history of science in the GDR in the 1970s and 1980s

During the 1970s and 1980s teaching and research in the history of science and mathematics in the GDR experienced their biggest boost. Harig’s posthumous reputation in the former state secretariat for universities, which was now promoted to a full ministry (MHF), was apparently huge and even renewed by the new minister.³² So it was not necessary to remind the ministry of the importance of the field. In fact, Wußing described it in his interview with Schlote as a “decision by the ministry, rather surprising to us, to gradually introduce obligatory courses on the history of their subjects for all students of mathematics, the sciences and technical disciplines” (Interview 70). One should not overlook that Walter Purkert, Wußing’s student, was working at the ministry from 1975 to 1979, which may have increased the ministry’s awareness of history of mathematics. In his job at the ministry, Purkert, who is also

³¹ There was serious research on the theory of science in the GDR as well. In Berlin, Rostock, and Halle, for instance, there were efforts to develop a Marxist theory of the genesis of disciplines, in comparison, cooperation and competition with Western approaches.

³² The minister from 1970 and during the remaining 19 years of the GDR was Hans-Joachim Böhme (1931-1995), an old acquaintance of Harig’s. In the beginning of the 1960s Böhme was secretary of the party-organization of Leipzig University, and Harig belonged to the leadership too.

exceptionally talented mathematically, was, however, primarily responsible for mathematics itself.³³ From his studies at the mathematics institute, Wußing had a very good relationship with several leading Leipzig mathematicians, which found its expression among other things in the joint publication in the *Leipziger Volkszeitung* of 1960 which was mentioned above. This paid off now with the introduction of historical lectures for mathematics students. The connection of the Sudhoff-Institute to the mathematical institute at Leipzig, which was secured by Wußing together with Purkert, was important in another respect too. Many dissertations in the history of mathematics passed officially as mathematical ones,³⁴ while the Sudhoff Institute belonged to the medical faculty.

The above mentioned ministerial decision, which introduced mandatory lectures, reflects the greater maturity and self-confidence of the university system of the GDR as well as a new step of development of the culture of the historiography of science, compared to the early 1960s. Another aspect was the strong support for publications in the history of science and mathematics in the 1970s and 1980s. Wußing overtook the scientific redaction of the German translation (1972) of D.J. Struik's "A Concise History of Mathematics" of 1948. The international name of Dirk Jan Struik (1894-2000) as a Marxist historian of mathematics undoubtedly supported the project. The extension of publishing in the history of science and mathematics was not to be taken for granted, given the originally rather small market. Nevertheless, the GDR, a small country of 17 million inhabitants, contributed considerably to the development of an all-German infrastructure in the historiography of science and mathematics (e.g. by producing biographical dictionaries, text-books etc.),³⁵ not least because the East German publications were usually much cheaper than the ones in the West.

At B.G. Teubner in Leipzig, which was a traditional place of book production in Germany, Wußing initiated the series "Biographies of outstanding scientists, technologists and medical men," which eventually included over 100 titles.³⁶ The richly illustrated "History of Natural Sciences" [Wußing, 1983] was almost unavailable in GDR bookshops,

³³ Among other things Purkert succeeded in promoting several able mathematicians to full professors even when they were not party members. Personally I owe much to Purkert who encouraged me around 1984 to speed up my habilitation procedures. Somewhat later Purkert used his old connections to save me from a longer service in the ministry MHF, which had been imposed upon me. Such a service could well have cost me all my chances of academic development after the political turn of 1989.

³⁴ My own Ph.D. dissertation was officially defended at the mathematical institute at Halle University in 1979, the one by Sonja Brentjes at Dresden's mathematical institute in 1977.

³⁵ Internationally unique was, for instance, the "Dictionary of important mathematicians" ("Lexikon bedeutender Mathematiker") [Gottwald, S., Ilgands, H.-J., Schlote, K.-H. (eds.), 1990], published in the last year of the existence of the GDR in 1990.

³⁶ Here appeared, among others, Wußing's short biographies of Adam Ries, Gauß and Newton. Other examples from the series written by authors from the GDR include Ibn Sina (S. Brentjes), N. Wiener (H.-J. Ilgands), Georg Cantor (W. Purkert/H.-J. Ilgands), Euclid (P. Schreiber), Euler (R. Thiele), and Felix Klein (R. Tobies).

because the book was primarily destined for sale in the West and for the acquisition of Western valuta. Two of Wußing's collaborators at the Sudhoff Institute followed his example and published textbooks on the history of chemistry [Strube et al., 1986] and physics [Schreier, 1988]; both appeared with the same East German publisher DVW as Wußing's "Vorlesungen zur Geschichte der Mathematik" [Wußing, 1979a].

The ministerial decision led also to the employment of additional teaching personnel outside Leipzig, for instance in Berlin, Rostock, Halle, and Dresden, and thus to a degree of institutionalization of the field never reached in Germany before (or after), even though parallel institutional developments in West Germany, which was three times as big as the GDR, were conspicuous too. In Siebenlehn in Saxony there were annual courses for the further education of teaching personnel in the history of science and mathematics, with the talks given by specialists being published. Of particular importance for the history of mathematics in East Germany was the "Division [Fachsektion] for History, Philosophy and Foundations of Mathematics," established in 1975 and led by Wußing within the "Mathematical Society of the GDR" (MGDDR). The latter had been founded in 1962 after the erection of the Berlin Wall. The foundation of the "Division" was – according to the memory of the Greifswald logician and historian of mathematics, Peter Schreiber (b. 1938) - a "piece of grassroots democracy" initiated by enthusiasts. Wußing liked the idea but was originally sceptical with respect to its possible realization. The Division held yearly meetings from 1977 (Halle), and regularly had 60 to 65 participants, among them many mathematics teachers and many years before 1989 visitors from the West. The "Communications" (Mitteilungen) of the MGDDR, which are difficult to find in libraries today, published many interesting articles on the history of mathematics, several of which resulted from the meetings of the Division. Peter Schreiber recalls it as very embarrassing that there was a "severe and totally unjustified ban on inviting Western colleagues to the meetings when they were organized at Pedagogical Universities."³⁷ A Norwegian guest, who had arrived in Güstrow for the meeting in 1979 was declined participation and Schreiber and Wußing had to organize an auxiliary program for him in Leipzig. After the dissolution of the MGDDR, as a consequence of the political turn of 1989, the former Division became – with strong involvement of Peter Schreiber - the model for the foundation of a similar division within the German Mathematical Society (DMV).

³⁷ Here, once again, the strong political orientation of GDR-pedagogy was effective, with Erich Honecker's wife Margot H. leading the ministry of popular education. When the Division for history reconvened at the Pedagogical University in Güstrow in 1987 Western colleagues such as J. Lützen and D. Rowe could participate.

In April 1981 there was a scientific symposium on the occasion of 75th anniversary of the Karl Sudhoff Institute. The strong participation of guests from abroad underlined the international recognition of GDR historiography of science and also of the GDR as an independent German state.³⁸

9. The working conditions for historians of mathematics in the GDR and the influence of Wußing

The 1970s and 1980s - when Wußing shaped research and teaching in the history of science in East Germany - were at the same time the decisive years for the personal development of his five closest students in the history of mathematics. They were born between 1944 and 1953 and were all employed at the Sudhoff Institute for at least 3 years. As the youngest of these students, and without being officially entitled by the other four to do so, I will say first something about my perspective on the working conditions in the GDR, and, somewhat later, about how I experienced Wußing personally as a man and a scholar.

I have already indicated that we in the GDR had freedom in choosing our research themes, although, as will be seen, the choice of the topics for our doctoral dissertations was in several cases influenced by Wußing in a helpful manner.³⁹ The strong factual ties and the objectivity of the history of science made it possible to avoid propagandistic topics of a too obvious kind in contrast to other fields of historiography. As all GDR citizens we had strong social guarantees,⁴⁰ in particular mostly permanent job contracts. These enabled continuity in scientific topics and rendered a constant and time-consuming concern for new job opportunities superfluous. Teaching duties were low in general, because they were distributed on many shoulders, and they were lower in the history of science and mathematics anyway. On the negative side the supply of literature both in libraries and bookshops was restricted. Fortunately, in our field pre-war literature, which was more accessible, had great importance. The publication system in the GDR and the market were not big enough to allow publications of research monographs.⁴¹ Another serious defect in the infrastructure of research was the

³⁸ The details of the symposium are described with pride in the article [Wußing/Schreier, 2006, 57/58].

³⁹ This was confirmed to me by Wolfgang Eccarius (Eisenach), who was not among the closest of Wußing's students, with respect to the topics of his two academic dissertations in the history of mathematics.

⁴⁰ These guarantees turned out to be illusionary though, after the Wall fell in 1989.

⁴¹ None of the historical dissertations A or B of Wußing's five closest students ever appeared as a book.

delayed introduction of modern copy- and communication systems, a delay which was also partly politically motivated.⁴²

A most severe restriction, which had both political and material reasons, was of course the lack of opportunity for international travel. On this I will comment separately further below.

In hindsight it is difficult to judge, how these advantages and disadvantages of being a historian of science in the GDR affected the scientific development of Wußing's students. Wußing had the far-sightedness to select students who had enough personal ambition and drive for publications, although the existing conditions, in particular social safety and the hopelessness of foreign travel, did not structurally encourage ambition. Moreover, Wußing had an unerring instinct for the internationally relevant research topic fitting the abilities of the respective person, although he behaved rather passively once the topic had been found. When Renate Tobies who was searching for an alternative to the politically strongly instrumentalized GDR pedagogy, looked for an internationally interesting topic, Wußing turned her attention to the mathematician Felix Klein with the following words: "Your experience is from teaching. Felix Klein has done much in that area, but almost nothing has been published on it." This turned out to be the basis for Tobies' long-term and successful occupation with the history of mathematical instruction, applied mathematics, women in mathematics, Felix Klein and related themes. The at least indirect influence of Wußing's "Genesis of the Abstract Group Concept" on the topics of the dissertations A or B of Purkert, Schlote and Siegmund-Schultze has been mentioned before. The development of Sonja Brentjes was somewhat further away from Wußing's topics. Brentjes is today an internationally recognized specialist for the history of Arabic-Islamic science and mathematics. Two foreign doctoral students of Wußing's (Sami Chalhoub 1980 and Sergio Nobre 1994), whose topics are mentioned in the Appendix, are now professors in Syria and Brazil.

As to international communication, Leipzig and the Sudhoff Institute were undoubtedly privileged in comparison to all other places in the GDR, including East Berlin. This was connected to Wußing's international influence, possibly to the politically marginal position of the town of Leipzig, but certainly these advantages were not least due to the

⁴² I recall with horror the method of "thermo copying" which was used at the Berlin Humboldt-University as late as in the mid 1980s. Only single sheets could be copied, and the copies were of delicate paper on which one could not write notes.

specifics of the institutionalization of the Sudhoff Institute and its relation to the mathematicians.⁴³

The seminar for the history of mathematics organized by Karl-Heinz Schlote at the Sudhoff Institute from 1979 became a meeting place for all East German historians of mathematics. At the same time it included among its speakers many historians from abroad, both from the East and the West. Western scholars were included from the very start of the seminar, among them in July 1979 D. J. Struik (USA) with a talk on “historiography of mathematics from Proclus to Cantor.”

Contacts with East European historians were, of course, closer.⁴⁴ Also at the Leipzig seminar East European historians presented their research regularly. For example A. P. Juschkewitsch gave a talk in April 1980 on the “Development of the concept of space.” The house of the Wußings was always open to international guests from East and West, and many stayed there overnight.⁴⁵

10. Travel to international conferences, in particular to the West

Even before 1989 Wußing was frequently on official travel to the West, often due to his positions as a GDR representative in various organisations. He had a three-month guest professorship in Japan 1978 and one in Syria 1984, as well as an IREX stipend in the USA 1985. He also visited regularly the international congresses for the history of science. He was, however, never able to take his wife Gerlinde with him on these trips.

He was aware of the fact that his opportunities to travel were bound to stir occasional envy among his collaborators and among his students. After 1989 Wußing acknowledged repeatedly the fact that he had been in a privileged position (Interview 77). In order to understand the situation for young scholars at the time some words have to be said about the East German system of “travel cadres” (“Reisekader”).⁴⁶ To travel to the West it was necessary to acquire the status of a “travel cadre”. This status had to be applied for by the

⁴³ In spite of the invoked comparison between Berlin and Leipzig, one must not misunderstand Leipzig as a “political oasis.” Much of what was possible at the Sudhoff Institute and the Mathematical Institute would have been impossible at the dogmatic “Section for Marxism-Leninism” at the same university.

⁴⁴ Hans Wußing’s contacts with the Czech historians of mathematics Luboš Nový and Jaroslav Folta were especially close. Wußing supported the invitation of Nový to Oberwolfach as is clear from a letter to J.E.Hofmann dated 3 September 1965 (see below).

⁴⁵ Among the early Western acquaintances and friends of Hans Wußing one should mention the historians of mathematics C. Binder, J. Dauben, Y. Dold, E. Fellmann, M. Folkerts, I. Grattan-Guinness, W. Kaunzner, E. Knobloch, D. Rowe, E. Scholz, C. Scriba and D. Struik, as well as the historians of physics and chemistry E. Hiebert (USA) and M. Tanaka (Japan).

⁴⁶ I became “Reisekader” in 1985 and was thereafter relatively privileged too, acquiring rights which were a matter of course for colleagues in the West. I recall interested and helpful hosts, for instance on the occasion of a talk in Frankfurt 1988, when David King generously allowed me to use the facilities of his institute.

respective superior, and the ministry of state security had its say. Membership of the SED was helpful in acquiring this status but it was by no means necessary or sufficient. Wußing's own daughter, an able biochemist, was denied travel to the West because her father was so often abroad. The dependence of the status of the travel cadre from superiors gave the latter a position of power which could not be justified on objective grounds. Moreover, given the scarcity of resources (travel money) there was no incentive on the part of superiors to apply on behalf of too many collaborators.⁴⁷ No official state propaganda about the alleged "socialist community of people" ("sozialistische Menschengemeinschaft") in the GDR could get around these facts. On the part of the privileged there was often a psychologically understandable secretiveness about their travel;⁴⁸ at the Sudhoff Institute, again, the situation seems to have been more open.⁴⁹ The status as a "travel cadre" was often used by the ministry for state security as an instrument to produce and enforce politically appropriate behaviour.⁵⁰ If acquiring the status of Reisekader was *necessary* for travel abroad, it was not *sufficient*, above all because of the scarcity of non-convertible Eastern currencies. Material restrictions also affected travel to Eastern Europe.⁵¹ Even travel to Moscow was rare and generally regulated by special contracts between institutions such as between the East German and Soviet Academies of Sciences.

A particularly desired, but in the end unreachable, goal for Wußing's students were the one-week long international workshops for the history of mathematics, which the West German mathematical research institute in Oberwolfach (Black Forest) organized almost annually. This tradition is still alive – if with somewhat less regularity. Instead of about 25 participants the workshops today include up to 55 participants. Invitations to Oberwolfach are still considered as recognition of their work by mathematicians (who visit other workshops with special topics) and historians of mathematics.

⁴⁷ In order not to be misunderstood: Walter Purkert stresses that Hans Wußing always did his utmost to support his students to become Reisekader.

⁴⁸ This was confirmed to me by Peter Schreiber for the conditions in Greifswald.

⁴⁹ At the Leipzig historical seminar Purkert and Wußing reported regularly on their participation at the workshops in West German Oberwolfach from the early 1980s (more below).

⁵⁰ When in 1984 I was proposed as a Reisekader, the state security was on the doorsteps of my home literally the day after and expressed interest in my international contacts. With words of loyalty and vague declarations of intent I hoped to maintain the ministry's support for my application. When I reached the status in 1985 I succeeded in keeping the state security at a distance and to avoid signing for "informal collaboration". After 1989 I read in the file kept on me at the ministry that they had broken off contact with me due to my lack of willingness to cooperate. Of course I do not know how I would have reacted to greater pressure, which certainly would have been exerted on me in the 1970s. In 1985, partly due to the fact that Gorbachov had become general secretary of the Communist Party of the Soviet Union that year, there was a certain liberalisation of public life in the GDR.

⁵¹ Until 1988 I was only once at a conference abroad. This was 1985 in Bulgarian Varna.

Wußing himself took part in Oberwolfach for the first time in early June 1965. He describes in his interview of 1999 how at that time, “it was the hightime of the Cold War,” the Bavarian border police locked him up in a toilet while searching his luggage for East German propaganda material, of course in vain (Interview, 75).

Wußing then describes how Joseph Ehrenfried Hofmann (1900-1973), the noted organizer of the history of mathematics workshops, which then were predominantly for conceptual history of mathematics, exclaimed surprised after Wußing’s talk on the history of group theory: “Herr Wußing! You really know the mathematics.”

11. Wußing’s contacts with Hofmann

Indeed the invitation to the workshop in 1965 had a prehistory, during which Hofmann had initially strong reservations against Wußing as a historian of mathematics. Hofmann expressed this bluntly in a personal letter to Wußing dated 5 July 1965, i.e. after Wußing’s successful presentation in Oberwolfach. The main reason for Hofmann’s reservations had been Wußing’s textbook “Mathematics in Antiquity” [1962]. In his letter Hofmann directed several criticisms in detail against the book. His main reproach, however, was a general and political one:⁵²

“Is it not without hesitation that I want to comment on your mathematics in antiquity. While I do not go into matters of world view (*weltanschauliche Dinge*) on principle, because I am not interested in ideologies and what follows from them, I must nevertheless remark that it is unobjective and inappropriate to permanently utter disparaging remarks which cannot be maintained with the best will in the world. This was the reason why – I had known your book for a long time – I had strong reservations about inviting you to our workshop.”

Hofmann, who did not specify his general criticism, was apparently alluding to passages such as the following in Wußing’s book, in which Wußing referred to “voluminous and partly obsolete representations of the history of mathematics”. Wußing elaborated that

„Those [representations] being products of bourgeois science, as a rule neglect the relations between social development and the progress of the mathematical sciences. They are usually ideologically marked by one or another variety of idealism, and in some cases they commit as a whole or in detail gross falsifications.”[Wußing, 1962, second edition 1965, v].

⁵² I thank Menso Folkerts for providing copies of the letters quoted in the following, which belong to Hofmann’s estate that will be deposited soon at the Leopoldina in Halle.

For example, Wußing attested that Platonic idealism “stimulated mathematical research, in spite of its detrimental effects in general” [Wußing, 1962, second edition 1965, 96].

We will not try to exempt Wußing’s interpretation of the philosophical foundations of Greek mathematics, which relies on ideological stereotypes, from possible criticism. However, Hofmann’s reply also seems one-sided but in the opposite direction. Given that Hofmann was the leading Leibniz scholar of his generation, one may, for instance, safely assume that the connections between Leibniz’ mathematics and philosophy did not escape him and that he, when speaking about “ideologies,” referred to concrete “political ideologies”. But even with that accepted, questions remain. Hofmann’s reply in the year 1965 comes from a man - both mathematically and philologically extremely able and self-confident - who a quarter of a century before had received resources for his research primarily because Nazi mathematicians such as Ludwig Bieberbach planned to celebrate the “great German” Leibniz. Hofmann’s duties at the Berlin Academy included visits to occupied France and Belgium in order to seize Leibniz documents. In November 1943 Hofmann’s house had been bombed and destroyed and he lost all of his manuscripts [Folkerts, 2011, 4]. Thus throughout his life Hofmann worked in an environment in which research was inextricably entwined with politics and ideologies. However, given that in the above mentioned letter he also told Wußing “We do objective science and have no time for sentiments”, it seems it was a past he wished to suppress.

Hofmann then continued by offering to publish Wußing’s “valuable” Oberwolfach talk on the history of the group concept in the journal “Praxis der Mathematik” but only on condition that Wußing freed it “from all things which can be ideologically attacked”. Even in Wußing’s most recent research it seems that Hofmann still saw objectionable ideological components.

Wußing, in an undated reply, thanked Hofmann for the criticism of his “Mathematics in Antiquity” and promised to take it into account in a later edition⁵³ “inasmuch as I can follow the criticism.” On 3 September that same year 1965 Wußing indicated in another letter to Hofmann, that he was unable to accept Hofmann’s proposal to publish his talk, because he had already planned a publication in NTM.⁵⁴ In the years to come Wußing would always prefer his own journal or East European ones for publications, probably not least in order to

⁵³ This would have been a third edition after 1962 and 1965, which, however, never appeared.

⁵⁴ This is the publication [Wußing, 2010] mentioned above, which appeared originally in 1965 in NTM and was based on a talk in Prague from December 1963, which was apparently very similar to the one in Oberwolfach. In the same letter Wußing supported the invitation of the Czech historian of mathematics Luboš Nový to the next workshop in Oberwolfach. Nový was however unable to accept the invitation.

avoid political controversies both in the West and the East. In 1969 Hofmann wrote to the publisher in East Berlin of Wußing's original German version of the "Genesis of the abstract group concept," thanking him for sending him a copy and praising above all the general conception and structure of the book:

"I have read with great pleasure the extremely interesting, even thrilling treatment of the details. However, it is not the details, clearly and painstakingly presented as they are, which is decisive here. Rather it is the conception which enables one to see everything under unifying and comprehensive viewpoints."⁵⁵

In the years from 1965 to 1969 there was further correspondence between Hofmann and Wußing, with the latter's nomination as successor to Harig, who had died suddenly in autumn 1966, receiving special attention. Among other things Wußing helped Hofmann in tracing literature by and on Michael Stifel, which was available in Leipzig. He was supported in this by his colleague Hannelore Bernhardt (b. 1935), another student of Harig's⁵⁶ and then historian of mathematics at the Sudhoff-Institute. Hofmann invited Wußing and other GDR historians of mathematics, in particular Biermann,⁵⁷ repeatedly to Oberwolfach.

12. The Oberwolfach workshops for the history of mathematics in the 1980s

These invitations, however, were largely without success after 1965. Wußing himself was able to return to Oberwolfach only in 1982. No other GDR historian came during that period either. Apparently there was a ban from the mid 1960s, issued by the GDR authorities against participation in Oberwolfach. This ban had been motivated by alleged "attempts at enticement" (Abwerbungsversuche) from the Western side, which had resulted in GDR mathematicians not returning from conferences in Oberwolfach.⁵⁸ Between 1982 and 1987 Wußing and Purkert took part in four historical workshops in Oberwolfach. One may assume that many international participants at those workshops had a strong interest in meeting Purkert as well, whose historical work, for instance on Dedekind's theory of ideals and on Cantor's own interpretation of the antinomies of set theory, began to stir attention.

In December 1982 Wußing himself talked on "Fundamental problems of the historiography of mathematics". According to the abstract, he stressed that "so far socio-

⁵⁵ Hofmann to VEB Deutscher Verlag der Wissenschaften, 5 April 1969. Copy in Hofmann's estate, thanks to M. Folkerts.

⁵⁶ Cf. [Bernhardt, 2004].

⁵⁷ On the basis of printed reports Kurt-R. Biermann, who was closer to Hofmann, both personally and academically, than Wußing, visited Oberwolfach five times between 1958 and 1965. Personal communication from Menso Folkerts.

⁵⁸ Personal communications from W. Purkert and M. Folkerts. A detailed historical investigation of this topic remains to be done.

economic investigations have been insufficiently undertaken” in the history of mathematics. In the Leipzig historical seminar, where Wußing and Purkert reported on 17 February 1983 on the meeting in Oberwolfach, Wußing called his talk the “first Marxist presentation” in Oberwolfach.⁵⁹ Even more interesting was Wußing’s commentary in Leipzig on the talk by another participant in Oberwolfach 1982, Herbert Mehrrens, who had spoken “On the Interpretation of the ‘crisis of the foundations’ in mathematics”. Wußing said that Mehrrens was not concerned about the development of mathematics as a scientific subject and his real interest was in the situation of mathematics in the time of Fascism. Moreover, Mehrrens’ construction of a connection between the foundational crisis and social conditions was, according to Wußing, “somewhat far-fetched”. It was these critical remarks by Wußing which for the first time aroused my interest in a closer study of Mehrrens’ pioneering research.

The workshops in Oberwolfach were – at least during the 1980s – even more lavishly funded than today. The invited East Europeans received daily allowances, in addition to free stay and reimbursement of transport. This was of course most attractive for the purchase of important and desired Western literature. However, there continued to exist multi-layered obstacles to invite, in addition to Wußing and Purkert (who represented the GDR also politically), other historians.

The West German organizers had to adapt to the situation, knowing that so-called “function carriers” (Funktionsträger) from the East had to be preferred. Invitations to other interesting scholars could be issued only in addition. Most importantly, the organizers needed some surety that their invitations would be accepted, because any cancellation on short notice would spoil opportunities for other possible interesting participants from the West.⁶⁰ However, a guarantee to accept an invitation could usually not be given, particularly in the case of scholars who were not yet “traveling cadres”. On the other hand, invitations could serve as a rationale to apply for the status of “traveling cadre” in the first place. The result was, anyway, that none of Wußing’s younger students went to Oberwolfach before 1988;⁶¹ at least in one case an invitation was issued which could not be accepted.⁶² The fact that

⁵⁹ This is according to my personal notes taken at the seminar in Leipzig. A published note on the seminar (giving only the titles of the talks) is in NTM 21 (1984), no.1, p. 122. The mathematical and historical workshops in Oberwolfach can now be followed and analyzed for the period 1960-1992 through abstracts of the talks at the website of the institute at oda.mfo.de.

⁶⁰ The main organizer of the historical workshops during the 1970s and 1980s, Christoph Scriba (Hamburg), reminded me of these difficulties in an email dated 26 July 2011.

⁶¹ Besides Wußing and Purkert only one East German, Olaf Neumann (Jena), took part, and then only once, in 1985.

⁶² This invitation was to Sonja Brentjes, as Menso Folkerts tells me, who was the organizer of the respective workshop in 1987.

Biermann never returned to Oberwolfach after 1965, not even in the 1980s, is probably due to his own decision and to his personality,⁶³ the fact that his wife would not be allowed to accompany him being one of his reasons.

It was only in 1988 that for the first time a considerable number of East German historians of mathematics came to Oberwolfach.

13. Hans Wußing as a man, teacher and political being, as I experienced him

In this penultimate section I want to describe how I personally experienced Hans Wußing. Naturally these remarks have to contain subjective elements and conjectures. In some points I will connect my description to facts mentioned above.

I met Wußing for the first time in February 1974 during an informal conversation at his office – filled with books – in the old building of the Sudhoff Institute in Leipzig's Talstraße, which the Institute had to leave in 1985.

It was one and a half years later, in autumn 1975, that the opportunity of a three-year-research grant ("Forschungsstudium") in the history of mathematics at the Sudhoff Institute materialized for me, and I terminated a purely mathematical research grant in Halle. I recall Wußing making me familiar with several books in the library, how enthusiastic he was about the classical works of historiography, how he put the small but thick and weighty "Histoire de la science sous la direction de Maurice Daumas" (Encyclopédie de la Pléiade, 1957) into my hands, and how much he recommended the short programmatic works by George Sarton of 1936 "The Study of the History of Mathematics" and "The Study of the History of Science" as an introduction.

In the following three years I could basically devote my entire time to research, without teaching duties and almost without consultation with Wußing. As a grantee I was freed from the duty of being present at the institute. This presence Wußing demanded, however, from his regular collaborators. Without it he would have hardly been able to realize the many joint publication projects of the Sudhoff Institute. Wußing's personal dealing with his collaborators was unpretentious and jovial. In particular he succeeded in easing the embarrassment of distinguishing between "comrades" ("Genossen") and "non-comrades" ("Nichtgenossen") among the collaborators, an embarrassment which often arose in the GDR and which in the German language was particularly palpable due to the possibility of addressing people either by "Du" or by the formal "Sie". As early as the end of the 1970s,

⁶³ It cannot be denied that Wußing was in his social manners more polished than Biermann and that he was more eager to have oral communication, which facilitated his international contacts.

Wußing introduced the “Du” among the collaborators as the general way of addressing each other.

Wußing appeared to me always as a very serious and conscientious person, who had little sense for casual and ironic remarks in political or non-political contexts. In comparison I often felt unable to mind my tongue, because Juvenal’s “Difficile est satiram non scribere” seemed too fit all too well on events in the public realm in the GDR. But it seems to me at least in hindsight that it was much to the benefit of the history of mathematics in the GDR that Wußing and partly Purkert had the say and not people like myself. It was of importance for our field too that Wußing was able to communicate with everybody in their own colloquial language. This was particularly useful in the “State of Workers and Peasants”, where people in important positions often had no higher academic education. Wußing had very friendly and obliging manners and impressed many foreigners with his charm, who maybe had expected to meet a sullen and obstinate political functionary.

There was no lack of political controversies and conflicts in the Leipzig of the 1960s and 1970s, among them conflicts which were particularly bound to provoke the conscience and discussions of historians. In 1968, the year when the Warsaw pact troops ended the Prague Spring, dogmatic politicians demolished the famous baroque church of the university in Leipzig, which had remained largely undamaged during the war. It was there that the new main building of the university was erected. Above the main entrance towered a 14 meters broad and 7 meters high Marx relief. In 2007, the main University building was, once again, pulled down and the Marx relief ended up as piece of memory and rubble at some place outside the city center.



Left: The main building of the University of Leipzig with the Marx relief in front. The building, which housed the Sudhoff Institute after the political turn of 1989, was demolished in 2007. Courtesy of University Archives Leipzig. **Right:** The new "Paulinum" of Leipzig University which replaced the old building and is today (2012) still under construction. It will house the mathematical institute. The architecture recalls the old "Paulaner Church" which originally stood on the site but was demolished in 1968. Courtesy of Pressestelle Universität Leipzig, Mr. Randy Kühn."]

There is no doubt on my mind that Wußing cannot have approved of the destruction of the university church and similar anti-historical follies. His ambiguous feelings he expressed quite often, although mostly in private. Peter Schreiber recalls the following typical statement by him: “For Socialism I am willing to let myself be torn to pieces. But for the GDR I don’t give a damn.”⁶⁴ And yet, he, as most of us, was convinced that the GDR was, at least “potentially,” the better German state. To many of us the GDR was just “not socialist enough” in the sense of democratic participation. Widely shared, however, was the view that capitalism as a system necessarily produces social inequality and war.⁶⁵ Of course Wußing, as all of us, modified his views over the years. In 1972, in a review of the West German book “Humanities and Nature. Their meaning for the man of today”⁶⁶ (1970) Wußing still expressed a rather unsophisticated societal and scientific optimism, which was typical of the early 1970s, particularly in the GDR. In the review he criticized in a patriotic East German manner the identification of the “German” with the “West German”. Wußing concluded that the author, due to the restriction of the discussion “to the concerns of Western world” had “missed a great theme.” The problem of the influence of natural scientists on the application of their results he finds, at the same time, “for the GDR of only historical interest” [Wußing, 1972]. In the 1980s, under new global political and environmental conditions, Wußing would not have repeated such views. However, he remained cautious in discussion and probably deemed it hopeless to go into politically sensitive historical and societal issues.⁶⁷

It seems to me that the preponderance of the political in the daily life of the GDR produced in some scholars, and partly also in Wußing, a certain de-politization. This gives an ironic turn to his words, quoted above, according to which it was not necessary to go into “inner emigration” when wishing to engage in “traditional” and pure history of science. After all, “pure historiography of science” can also be interpreted as avoiding discussion of the political dimension of science.

Personally I experienced a certain reserve on the part of Wußing against one of my research topics, the development of mathematics in the Third Reich.⁶⁸ He knew of course as much as I knew that research about the grey zones of cooperation between the Nazi

⁶⁴ “Für den Sozialismus würde ich mich in Stücke reißen lassen, aber die DDR könnte ich auf den Mond schießen.”

⁶⁵ Both convictions have been confirmed to many GDR citizens after 1989. Both globalization and no longer need of “windowdressing” vis-à-vis a competing alternative system have led to a much colder political and social climate in the united Germany.

⁶⁶ “Geisteswissenschaft und Natur. Ihre Bedeutung für den Menschen von heute”

⁶⁷ As late as in 1983 another student of Harig’s claimed against better knowledge that Harig returned to Germany in 1938 “for illegal work”, remaining silent about his deportation by the Soviets [Harig, 1983, 323].

⁶⁸ Cf. [Siegmond-Schultze, 2009].

dictatorship and the professors in the Third Reich was not in the focus of traditional GDR-historiography. The latter was more concerned about the economic and ideological roots of National Socialism (NS) and about proletarian resistance in the Third Reich, and was in this respect, particularly with strong archival analyses, not without influence in the international historical discussion. However, Marxist categories of explanation could not easily account for the anti-Semitism of the NS-regime. Certain formal similarities between the political systems of the NS and the GDR made it also difficult to base a successful career as a historian in East Germany on these topics. However, one has also to consider that Wußing's skepticism against "research on fascism," which I experienced in many discussions, was – in the same manner as his reserves against speculative theory of science – based on his concern that such research could lead too far away from the "real mathematical content". Already Wußing's criticism of Mehrtens' discussion of the foundational crisis in Oberwolfach 1982 (see above) had indicated this legitimate concern.

Wußing's position vis-à-vis "NS and Science" changed towards the end of the GDR, when he realised that this topic was being much discussed internationally. He secured my election as a member of the GDR council for the history of science⁶⁹ and supported my preparation of an international conference dedicated to the topic. This conference took place shortly before the end of the GDR in June 1990 in Gosen near Berlin with strong participation of West German historians.⁷⁰ However, Wußing did not support my efforts to publish a book on "Mathematics in NS" in the series he founded in 1988 together with the American Erwin Hiebert „Science Networks“, of which he was "particularly proud" (Interview 68).⁷¹ I have to note as well that Wußing, in his popular cultural history of mathematics [Wußing, 2008/2009] quotes obsolete sources instead of newer ones – apparently he was never quite at ease with the NS topic.

Personally I regret that Wußing, who belonged to the editorial board of *Historia Mathematica* from the beginning, without publishing a single paper in that journal, apparently

⁶⁹ At the same time Wußing tried to draw me to Leipzig. But my hesitation and the end of the GDR let these plans fail.

⁷⁰ The circumstances of the time, in particular my loss of institutional affiliation, prevented publication of the proceedings.

⁷¹ Even before 1989 Wußing accepted the plan of a joint publication on mathematics under NS with the leading West German specialist, Herbert Mehrtens, with whom I had been friends since 1985. The project failed in the end due to the consequences which the political turn brought both to the biographies of the prospective authors and to the archival situation. Among other things the NSDAP files of the Berlin Document Center first became available to me after 1989. Likewise for Mehrtens, the files of the NS education ministries, once kept in East German Potsdam and Merseburg, also became available after 1989. The opening of the war and pre-war files of the German Mathematical Society in Freiburg revealed a new corpus of sources. To take all this new information into account would have required a thorough revision of the existing book manuscript which was not possible under the new working conditions.

never encouraged others to publish there either. This regret comes particularly in hindsight, because 1989 everybody was measured in relation to publications in the West, while former publications in the East were often disqualified outright. In the GDR we were forced to create our connections to Western scientists and journals by ourselves, which was not easy under the political conditions, given the restriction even of correspondence (at least in Berlin), in spite of the relatively good starting points in Leipzig. One had to overcome psychological self-restrictions too. Without the encouragement of the least inhibited of my fellow students, I would never have written directly to Western historians of mathematics. I did this 1980 with Morris Kline in New York, who reacted in a very friendly way, sent me his substantial history of mathematics of 1972, not available to me before, and published in 1982 large parts of my thesis on the early history of functional analysis in “Archive for History of Exact Sciences” – alas only in German.

If one criticizes Wußing’s neglect of Western journals, where he himself did not publish either, one has to acknowledge his concern for the GDR-journal *NTM*, which he continued after Harig and of which he was justifiedly proud. The journal also served to secure copies of Western publications for reviewers, most of the latter from the Sudhoff Institute. It is a testament to Wußing’s objectivity and modesty that he as an editor did not misuse *NTM* for self-advertisement. It is remarkable that neither the German original of Wußing’s main work “Genesis” of 1969 nor its American translation of 1984 received reviews in *NTM*.

The conclusion about Wußing’s journal policies is nuanced, as is much which has been reported in this article. *NTM* was an important nucleus of East German research on the history of science and mathematics, although some Western historians admitted privately after 1989 that they had not followed it regularly, partly due to political reservations. *NTM* has survived the political turn, not least due to the relentless efforts of Wußing’s student Renate Tobies as managing editor.

14. Hans Wußing’s last decades and the decline of the history of science and mathematics in East Germany

In 1989 the division for history of science and mathematics of the Karl Sudhoff Institute comprised one professor, two docents and eight assistants, as well as several doctoral students (Interview, 75). Today not a single position for history of science and mathematics is left at the Institute. The Sudhoff Institute has been reduced to the history of medicine, as had been the case in 1957 when Harig took over. In the same manner, most of the other centers for history of science in the GDR have been “unwound“ (“abgewickelt”) or severely reduced and

replaced in their personnel by Western scholars [Siegmond-Schultze, 1996]. The Academy Institute for History and Theory of Science in Berlin received a certain preferential treatment, because the Max Planck Society took over several former workers, among them a student of Wußing (Annette Vogt). Also the Alexander von Humboldt Research Center - formerly led by Kurt-R. Biermann at the Berlin Academy - continues to exist. The “unwinding” affected nearly all the sciences of the GDR. The peculiarities of the “doubling” of positions in changed structures within the united Germany (a problem which did not occur in other countries in Eastern Europe) and the understandable loyalty of the dominating West German scholars to their own students had predictable consequences. Not just problems of employment but also the specifics of the former socialisation in the East (e.g. the on average lower proficiency in the English language, the devaluation of the competence in Russian, and the insufficient acknowledgement of our former publications) were liabilities for the future careers of not a few East German historians of science.⁷²

Four of the five closer students of Wußing, who have been repeatedly mentioned in this article, have experienced problems in their careers, particularly in their employment, due to the political turn in 1989/90 and the ensuing cuts. Only Karl-Heinz Schlote (b. 1949) was able to keep until recently his position at the Saxonian Academy of Science in Leipzig and was therefore in the two decades following 1989 Wußing’s most important collaborator. All five closer students continue today in their research in the historiography of mathematics, two of them outside Germany. All of them are now corresponding or full members of the “Académie internationale d’histoire des sciences,” to which Wußing had been elected in 1981. A few years before his death, Wußing could draw a rather positive conclusion about the careers of his students, something which was probably a consolation for him given the destruction of his institute [Wußing, 2007, 288]. In all fairness one must also report about the considerable support given to Wußing’s students by various scholars from the West⁷³ and by several politically impartial organisations, such as the Alexander von Humboldt Foundation (Bonn). The bridges to Western colleagues, built by Wußing and Purkert before 1989, were now paying off for the next generation. Although Wußing was no longer a GDR representative, he continued to be regularly invited to the workshops in Oberwolfach, now accompanied by his wife Gerlinde.

⁷² Peter Schreiber (Stralsund) tells me that his publications were almost ignored in the West and that his coauthorship in the successful volume “5000 Jahre Geometrie” (Springer 2001) materialized due to his personal acquaintance with Ch. Scriba.

⁷³ Here I have to mention in particular M. Folkerts, D. King, E. Knobloch, H. Neunzert, K. Reich, D.E. Rowe, E. Scholz and Ch. Scriba.

Wußing was repeatedly honored even before the political turn. He had been for instance Assistant Secretary and Vice President of the Internationalen Union for History and Philosophy of Science (IUHPS). Of all the honors he was most excited about the volume “Amphora” [Demidov et al., 1992], a book with contributions by 36 prominent historians of mathematics from 10 countries, which was dedicated to his 65th birthday in 1992. In 1993 Wußing received the Kenneth O. May Medal, which is awarded every four years by the “International Commission on History of Mathematics” for extraordinary accomplishments in the historiography of mathematics.

Until almost his last day, Wußing worked on the history of science and mathematics, devotedly supported by his wife Gerlinde. He could, on the one hand, fully realize his penchant for a popular representation of the history of mathematics, using among other things his beloved stamps with illustrations from the history of science. On the other hand, he even found time for new research; not least because he now had little organisational work. Among other things he showed together with T. Wittig, that the Coß of 1578 by Abraham Ries, the son of Adam Ries, was not a simple copy of his father’s work, but relatively independent [Wußing, 1993]. In 1999 Wußing published a complete edition of Abraham Ries’ Coß.

Wußing remained optimistic until the end that – for all fluctuations in political and historiographical fashions - historical materialism as an alternative point of view would retain its importance within research in the history of science and mathematics. I recall with some emotion the enthusiasm and immense activity which Hans and Gerlinde Wußing showed when supporting me in 2002 in the preparation of a talk before the DGGMNT in Wittenberg on the important American Marxist historian of science and mathematics Dirk Jan Struik.

Also Wußing’s main work, the “Genesis,” continues to have influence. In his talk at the funeral ceremony for Wußing in Leipzig on 25 May 2011 Purkert acknowledged traces of Wußing’s methodology in the current Felix Hausdorff edition in Bonn in nine volumes.

Hans Wußing had died 26 April 2011 in Leipzig, after suffering from cancer for several years.

To me, Hans Wußing, who was the first to show me the Poggendorff, who explained to me the difference between a mathematical and a historical proof, who inspired me with his energy and with his ambition, remains one of the most important human beings I have met.

Appendix:

Theses in the historiography of mathematics for which Wußing wrote opinions

According to the academic tradition in Germany, which was maintained in East Germany, in the course of an academic career which was to lead potentially to a full professorship, two theses had to be written, the doctoral thesis and the habilitation thesis, which in the GDR had the names dissertation A and dissertation B.

The main source of the following list is [Fahrenbach, 1996].

The list has been complemented with respect to dissertations which were defended at places other than the University of Leipzig. In these cases the places outside Leipzig are mentioned. Most theses are quoted with abbreviated title. Many results are published in national and international journals. To my knowledge, none of the theses, all of which are available as typed manuscripts in the Deutsche Bibliothek Frankfurt, has been printed as a monograph.

Dissertations A

Purkert, Walter: Die Entwicklung des abstrakten Körperbegriffs (1972)

Borgwadt, Heidemarie: Die historische Entwicklung der Funktionalanalysis zu einer selbständigen mathematischen Disziplin (Güstrow 1973)

Eccarius, Wolfgang: Der Techniker und Mathematiker August Leopold Crelle ... (1974)

Richter, Kurt: Zur Herausbildung, Entstehung und Entwicklung des Begriffs der gleichmäßigen Konvergenz ... (Halle 1975)

Brentjes, Sonja: Untersuchungen zur Geschichte der linearen Optimierung ... (Dresden 1977)

Siegmund-Schultze, Reinhard: Die Anfänge der Funktionalanalysis ... (Halle 1979)

Chalhoub, Sami: Sibt al-Maridini's Handschrift Tuhfat ... (1980)

König, Fritz: Die Entstehung des Mathematischen Seminars an der Universität Leipzig ... (1981)

Koch, Helga: Oskar Xaver Schlömilch - Mathematiker, Wissenschafts- und Bildungsorganisator (Dresden 1986)

Vogt, Annette: Die Herausbildung der modernen Funktionentheorie in den Arbeiten von Riemann und Weierstraß ... (1986)

Nobre, Sergio: Über die Mathematik in Zedlers 'Universallexikon' ... (1994)

Loh, André: August Ferdinand Möbius ... (1995)

Dissertations B

Tobies, Renate: Die gesellschaftliche Stellung deutscher mathematischer Organisationen und ihre Funktion bei der Veränderung der gesellschaftlichen Wirksamkeit der Mathematik (1871–1933)...., (1986)

Schlote, Karl-Heinz: Die Entwicklung der Algebrentheorie ... (1987)

Eccarius, Wolfgang: Mathematik und Mathematikunterricht im Thüringen des 19. Jahrhunderts : e. Studie zum Alltag e. Wissenschaft zwischen 1800 u. 1915 (1987)

Brentjes, Sonja: Das zahlentheoretische Werk ... von Ibn Fallus ... Wirkungsgeschichte der Nikomachos- Tradition in der Zahlentheorie im islamischen Mittelalter (1989)

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