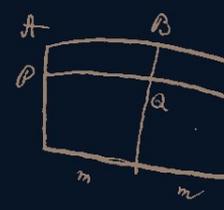
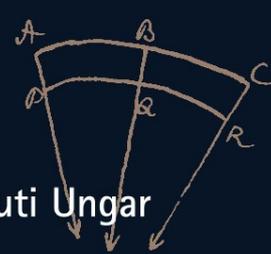
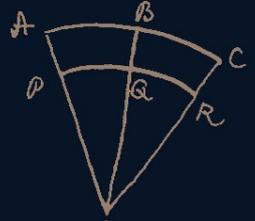




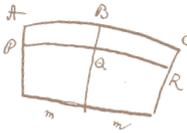
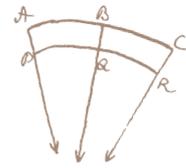
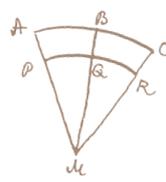
Edited by
Birgit Bergmann Moritz Epple Ruti Ungar



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Transcending Tradition

Jewish Mathematicians in
German-Speaking Academic Culture



Transcending Tradition

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Wissenschaftsgeschichte

Grüneburgplatz 1

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www.gj-math.de

Translated and revised English edition

Layout

init: feil und partner, Roswitha Feil

Frankfurt am Main

Translators

Susanne Bernhart, Staci von Boeckmann, Nicole Gentz, Stefani Ross

English language editor

Nicole Gentz

ISBN 978-3-642-22463-8 ISBN 978-3-642-22464-5 (eBook)

DOI 10.1007/978-3-642-22464-5

Springer Heidelberg Dordrecht London New York

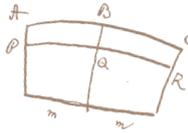
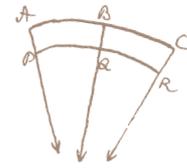
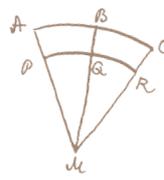
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We dedicate this exhibition to
all the Jewish mathematicians, who could not flee
Germany in time after 1933.

$$\begin{aligned}
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Preface

In the years after 1933, and occasionally even earlier, Jewish academics in Germany – and later in other countries occupied by German troops – lost their positions. Those who could not leave in time were sent to ghettos and deported to concentration camps. Some of those who managed to flee or to survive the camps were able to establish new careers in their host countries. Others, however, suffered greatly from the losses caused by their forced exile. Only very few returned to Germany following the end of the Nazi regime.

Mathematics was one of the sciences where the impact of Nazi persecution was strongest. For decades before their expulsion or extermination, Jewish mathematicians had become an important part of the German-speaking mathematical world. Advancement through education, the social trend so characteristic of German-Jewish life in the 19th and early 20th centuries, was highly successful in the field of mathematics. Even though discrimination and anti-Semitism never fully disappeared, the traditional barriers for Jews to enter universities began to weaken in the course of the 19th century, and a significant number of Jews undertook academic careers in mathematics. In the decades before and after 1900, when mathematics was undergoing a deep intellectual and professional transformation, many of them held professorships or other important positions in professional life. These mathematicians, therefore, were transcending tradition in at least two ways: they had overcome the long-lasting discrimination against Jewish scholars, and in a joint effort with their non-Jewish colleagues, they contributed to the process of modernization that was restructuring their field.

This exhibition aims to showcase the impressive technical and professional scope of this contribution. It concentrates on the period in which Jewish mathematicians in German-speaking countries achieved their most prominent successes: between the legal and political emancipation of German Jews in the 19th century and the Nazi years. For pragmatic reasons, the exhibition focuses on Germany, though much could be added for Austria and Switzerland. The exhibition highlights two points in particular. First, there was no part of the academic culture of mathematics during the period in question in which Jewish mathematicians were not actively involved. In the German Empire and the Weimar Republic, Jewish mathematicians worked in research, teaching, and publishing, they were active in professional organizations like the German Mathematical Society, and they participated in the public discourse on mathematics. They contributed to shaping the German-speaking mathematical culture of their time. Second, their activities were so varied and multifaceted that any stereotype of a “Jewish” style in mathematics can be immediately dismissed.

Still, it is impossible to consider these achievements without calling to mind what was to follow: the ousting, expulsion and persecution of Jewish colleagues. These crimes have been thoroughly researched by Reinhard Siegmund-Schultze and others, and they were the subject of an exhibition at the 1998 International Congress of Mathematicians in Berlin. Moreover, it is important to understand the achievements of Jewish mathematicians within the context of the segregation and discrimination that had been part of the daily lives of Jews for centuries. When seen in this perspective, the short period of flourishing cooperation between Jewish and

non-Jewish mathematicians in Germany before 1933 testifies to the great, and in some cases even surprising possibilities that open up when discrimination against a minority disappears. Throughout its history, mathematics has more than once demonstrated its potential to cross cultural borders – and the story told here is another case in point. It also shows the enormous damage done when hatred and discrimination threaten the lives of those who had been, and could still have been, crucial members of a thriving scientific culture.

The exhibition team:

Birgit Bergmann
Moritz Epple
Walter Purkert
Volker R. Remmert
David E. Rowe
Erhard Scholz
Ruti Ungar
Annette Vogt

Foreword

Dear readers and visitors of the exhibition,

Shedding light on the life and works of Jewish mathematicians in Germany in the 19th and early 20th centuries is an important and challenging task. Professor Moritz Epple and his team have done an excellent job of presenting this important subject in a manner which is both sensitive and compelling, not only for exhibition visitors interested in history or mathematics.

The documents gathered here vividly illustrate the crucial role played by Jewish scholars in all areas of mathematical life in the Wilhelmine Empire and the Weimar Republic: as researchers and scientists as well as teachers, journalists, and shapers of opinion. During the Weimar Republic, approximately one-third of the leading mathematicians in Germany were Jewish. Together with their non-Jewish colleagues, they helped bring outstanding international recognition and prestige to mathematical research and teaching in the German-speaking world. The Nazi rule put an end to this long phase of scientific prosperity. Jewish mathematicians were either forced to flee, or they were murdered. Part of the exhibition is devoted to this very destructive chapter in German scientific and cultural history.

Today in Germany, there is once again outstanding research being done in both pure and applied mathematics. That this has become possible is due, among other things, to the fact that mathematicians from many different countries live and work in Germany today, and that international cooperation is steadily increasing. The committed work of mathematicians in Germany and the achievements in modern mathematics received special attention in 2008, declared Jahr der Mathematik, a year devoted to the subject of mathematics, by the German government and the German Mathematical Society. The Deutsche Telekom Stiftung provided substantial support for events planned during this scientific year. Our goal as a foundation is to generate interest in mathematics and, in so doing, to show above all its importance and multifaceted nature as well as its historical development.

Providing support for this exhibition represented a particularly exciting opportunity for our foundation. I am convinced that it will contribute to open up new and expanded access to mathematics for many, and that it will help to further international cooperation and understanding in mathematics. Therefore, we are very happy that the support of the German Federal Ministry of Education and Research, of the Federal Foreign Office, and of the Ministry for Innovation, Science and Research of the State North Rhine-Westphalia has made it possible that the exhibition is now going abroad.



Dr. Klaus Kinkel
President, Deutsche Telekom Stiftung
Oktober 2011



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Introduction

Of the 94 full professorships in mathematics at German universities and institutes of higher education at the end of the Weimar Republic, twenty were held by Jewish mathematicians. Indeed if we consider the entire period between 1914 and 1933, as many as twenty-eight of these chairs were at least temporarily occupied by scholars who were Jewish or of Jewish descent. And although the exact number of Extraordinariate – paid or unpaid professorships of lower rank – is difficult to determine and was subject to constant fluctuation, we can assume that the percentage of Jewish mathematicians among them was similar. If we add to this the number of scholars who as a result of anti-Semitism or other factors were not permitted to submit a habilitation thesis and thus qualify for professorship, and if we keep in mind, too, the many Jewish mathematicians at German-speaking universities in Zurich, Vienna, Prague and other cities, it becomes clear that mathematical life in pre-1933 Germany and neighboring German-speaking countries was to a considerable extent a German-Jewish mathematical life.

Such was not always the case, nor was it equally true in all places. Before Jews obtained political and legal equality in Prussia and other German states in the course of the 19th century, there were no Jewish mathematicians at German-speaking universities and only a very few converts – despite the fact that Jewish scholars had been closely involved in the flourishing of mathematical sciences in medieval Europe, when the first great wave of translations of Greek and Arabic scientific texts reached Christian courts and universities. Moreover, Jews had been continuously involved in mathematics and related academic pursuits within their own culture – as the indefatigable Moritz Steinschneider amply demonstrated in the late 19th century. In spite of improvements, anti-Judaism and anti-Semitism also remained characteristic in both the Wilhelmine Empire (1871 – 1918) and the Weimar Republic (1919-1933). In some German cities these sentiments remained so strong that Jewish mathematicians could still not manage to gain a foothold in academic life even after Jews had achieved legal and political equality. In other cities, however, particularly those where Jewish life had been able to develop with fewer constraints after the mid-19th century, mathematicians from Jewish families managed to achieve remarkable academic success – not only in the great centers of German-language mathematics like Berlin and Gottingen, but also in certain liberal cities such as Frankfurt, Bonn or Heidelberg. During the Weimar Republic, institutes of mathematics in these cities were run almost exclusively by Jewish mathematicians.

Not only the physical but also the intellectual landscape of German-language mathematics in the early 1930s would be impossible to imagine without German-Jewish mathematicians. Indeed, some fields of mathematics were completely transformed by their contributions. Number theory was reshaped by Hermann Minkowski and Edmund Landau, algebra by Ernst Steinitz and Emmy Noether, set theory and general topology by Felix Hausdorff, Abraham Fraenkel and several others – to mention but a few examples. In many rapidly expanding fields of modern mathematics, German-Jewish mathematicians contributed ground-breaking research – such as Adolf Hurwitz in function theory, Max Dehn in geometrical topology, or Paul Bernays in the foundations of mathematics. However, German-Jewish mathematicians did not limit their interest to ‘pure mathematics’. Carl Gustav Jacobi made

major contributions to the theory of elliptical functions (a field already shaped by many other Jewish mathematicians in the 19th century: Ferdinand Gotthold Eisenstein, Leopold Kronecker, Leo Königsberger etc.) as well as to mechanics. Karl Schwarzschild's dissertation dealt with celestial mechanics, which later became an object of mathematical interest for Aurel Wintner. As an astronomer well-versed in mathematics, Schwarzschild also turned some of his attention to Einstein's relativity theory; similarly Emmy Noether and Jacob Grommer also contributed to the mathematical basis of Einstein's theory. Arthur Schoenflies and others brought the group-theoretical classification of crystal structures to a new level. Richard Courant and the young John von Neumann worked on new ways of presenting the methods of mathematical physics and, specifically, quantum theory. Applied mathematics, an expanding field at German institutions in the 1920s, owed much to the work of Richard von Mises, and the mathematical engineering sciences of hydrodynamics and aerodynamics to the contributions of Theodore von Kármán and Leon Lichtenstein.

A similar picture emerges for the professional infrastructure of mathematics and for the discipline's manifestation in broader culture. Whether it was Crelle's (later Borchardt's) *Journal für die reine und angewandte Mathematik*, the *Mathematische Annalen* or *Zeitschrift für angewandte Mathematik und Mechanik*, nearly all important journals had Jewish mathematicians on their editorial staff. Even the leading international mathematics publishing house, Julius Springer Verlag (whose founder was himself Jewish), profited substantially from its collaboration with Richard Courant and numerous Jewish authors. Jewish mathematicians were involved in the foundation of the *Deutsche Mathematiker-Vereinigung (DMV)* [German Mathematical Society] in 1890 as well as in setting up the *Gesellschaft für angewandte Mathematik und Mechanik (GAMM)* [Society for Applied Mathematics and Mechanics] in 1922. In many publications on academic culture for a general audience, and in all of the important debates on the role of mathematics in human culture, their voices carried well beyond the borders of their discipline.

These remarkable phenomena, described in detail in the exhibition, raise a number of interesting historical questions. How could this small section of the population achieve such academic success in just a few decades, despite all the lingering hostilities they faced? What role did Jewish mathematicians play in the rapid modernization of German-language mathematical culture that took place in the transition from the 19th to the 20th century? Why was there no substantial resistance to their expulsion initially from Germany and later from Europe, even from within their own discipline? How many of the mathematicians who had been forced to flee the Nazi regime returned to one of the two German states after the war?

The first question has been posed repeatedly since the early 20th century. The phenomenon has often been explained as a specific reaction to the social and cultural marginalization of Jews, as proposed by Thorstein Veblen's much-discussed hypothesis; more recently, other exceptional characteristics of German-Jewish academics have come to light which focus on particular paths toward qualification, a specific dynamic of cultural integration following political-legal equality, or even simply on the affinity of the cultural values of German-Jewish middle-class families to the values of scientific activity (cf. contributions by Volkov, Mosse and Charpa as listed in the bibliography). These answers have themselves raised new questions, and the discussion is not expected to end anytime soon. One of the specific

questions that remain is why Jewish scholars came to be so heavily involved in the field of mathematics in particular. To date there have been no detailed investigations on this topic (comparable, for example, to Ute Deichmann's study of chemists and biochemists). It might be that the international character of mathematics and certain discipline-specific components of its academic value structure – its strong research orientation and its implicit universalism – played a role, together with the fact that the career field for mathematicians underwent significant changes during the period examined by this exhibition, opening up an unusually large number of new opportunities.

The lack of recognizable resistance to the expulsion of Jewish colleagues and the difficulties attendant to their return are, by contrast, well-known – and not only in the field of mathematics. Reinhard Siegmund-Schultze's important book, *Mathematiker auf der Flucht vor Hitler* (1998) – meanwhile translated and revised under the title *Mathematicians Fleeing from Nazi Germany: Individual Fates and Global Impact* (2009) – describes the processes of persecution and emigration in detail, and our exhibition owes much to his work. Questions regarding the return of these mathematicians – attempts at remigration, failures and rare successes – as well as the resumption of professional and personal communication between émigré mathematicians and their German colleagues after 1945 still remain largely unanswered in historical research.

In whatever ways all these questions may finally be answered, we cannot deny the fact that the German-speaking mathematical culture of the Wilhelmine Empire and the Weimar Republic would have been inconceivable without the active contribution of Jewish mathematicians. By around 1900 at the latest, German-Jewish mathematicians were an essential and integral part of this culture, and both Jewish and non-Jewish colleagues worked together to advance their discipline in Germany. This remains true even if Jews were still discriminated as a minority in German society, and even if, in sociological terms, there was never a coherent group of German-Jewish mathematicians. Their scientific and academic backgrounds were too different, as were their cultural, political, and religious attitudes. Some openly and consciously adhered to Jewish cultural traditions while others (particularly during the Wilhelmine Empire) sought to integrate into German society and culture as completely as possible. Those scientists who distanced themselves from religious tradition as a result of legal requirements, continuing anti-Semitism or their own cosmopolitan viewpoint, sometimes entirely rejected their Jewishness, sometimes developed a new and fragile, secular-oriented Jewish identity as a reaction to the anti-Semitism that was gradually spreading across Europe.

Any attempt to describe the period stretching from the establishment of the Wilhelmine Empire to the beginning of the Nazi era as a history of 'German' mathematics without German-Jewish participation is, therefore, so excessively counterfactual that it is doomed to failure from the very beginning. And yet, after the Nazis' successes at the ballot box, all too many Germans energetically attempted to create facts out of counterfactuals, turning into a reality something that had previously been almost inconceivable. At a striking pace, they marched towards the elimination of the Jewish component of German society and culture, even in the relatively limited and small science, profession and culture of mathematics. The results of this discontinuity can still be felt in today's mathematical culture in a variety of ways.

Perhaps now is the time to imagine an alternative course of the history of German-speaking mathematical culture, one that is contrary to the actual course of events. What would it have been like if the flourishing mathematical culture to which this exhibition is devoted had been allowed to continue in a world free of anti-Semitism and of the crimes against humanity committed by the Nazis and their followers?

The exhibition

The exhibition and catalogue are divided into ten sections. The first two sections provide a general introduction to the subject; the final three summarize the most important outcomes of the persecution, expulsion and emigration of the Jews in Germany, the few attempts at returning after 1945, and they commemorate the victims of the Holocaust. The other sections function for the most part independently and can be read in any order.

Section 1

From Exclusion to Acceptance, from Acceptance to Persecution

The first section begins with a brief overview of Jewish intellectual life before Jews were granted legal equality and emancipation in the 19th century. It also describes the role of Jewish mathematical scholars in earlier times, from their involvement in the translation of ancient works during the Middle Ages up to their first steps in the world of European universities. Next, the section summarizes the legal, political and cultural framework of Jewish life in Germany up to 1933.

The stages of emancipation and the career opportunities that opened up as a result are explored primarily for Prussia and later for the Wilhelmine Empire, as are the waves of anti-Semitism that ran through the late 19th and early 20th centuries. The concept of advancement through education, which characterized the cultural self-image of many middle-class German-Jewish families in the 19th century, provides an important context for the activity of Jewish scientists from the Wilhelmine Empire up to the Weimar Republic.

Section 2

People

This section presents general information on Jewish mathematicians in the Wilhelmine Empire and the Weimar Republic. Various charts and maps show all known Jewish mathematicians who regularly taught or did research at German universities, and the places of their professional activity. The section also provides an overview of how the presence of Jewish mathematicians at universities in the period of about 150 years covered by the exhibition changed as a result of their gradual emancipation, and how the emancipatory trend varied regionally. The material is expanded by an (incomplete) list of sources preserved in various German university archives in the appendix. The data presented here are based on primary research and provide the most comprehensive information available for the mathematicians of the period under review. A corresponding database in the internet version of the exhibition will be provided at a later date.

Section 3 Places

As Section 2 shows, Jewish mathematicians were not equally represented in all places. The particular character of a city – and the extent to which it allowed Jewish life to unfold – played an important role for Jewish citizens. Section 3, therefore, examines various places where Jewish mathematicians were involved in the mathematical culture of a city for an extended period of time. The cities covered in this section include the two large centers for German-speaking mathematics, Berlin and Göttingen, as well as other cities in which German-Jewish culture was particularly lively, such as Bonn and Frankfurt, the two cities selected here. For these places, the section also provides examples of how the Jewish mathematicians who lived and worked in a particular city were connected with the general culture of that city.

Since many of the mathematicians included here were professionally active at more than one location, several other cities are mentioned in this and other sections of the exhibition, among them Königsberg (now Kaliningrad), Zurich, Vienna, Munich and Heidelberg.

Section 4 Writings

This section presents a selection of about 50 monographs, influential textbooks and, in a few cases, collected works of Jewish mathematicians. The exhibited works can be leafed through and read by visitors to the exhibition. The books on display rank among the most important mathematical works of their time. In this catalogue you will find the title pages of these books accompanied by brief descriptions of their authors' contributions to mathematics.

Section 5 Professional Commitment

From the beginning, German-Jewish mathematicians were also involved in the organs of the mathematical profession: in the publication of journals, in collaborating with publishing houses, specifically the Springer Verlag, and in professional associations. This section reminds visitors of some of the personalities who left a significant imprint on the German-language mathematics publishing houses of the 19th and 20th centuries: Carl Wilhelm Borchardt, Leon Lichtenstein, Otto Blumenthal, Richard Courant and Richard von Mises. The section also illuminates the participation of Jewish mathematicians in the founding of the German Mathematical Society and the Society for Applied Mathematics and Mechanics.

Section 6 Mathematics in Culture

Jewish mathematicians were involved in making the intriguing questions of their discipline accessible to a larger public beyond the borders of their scientific community, and in explaining the role of mathematics in general culture. This section presents selected aspects of this engagement – from the controversy between Alfred Pringsheim and Felix Klein on the question of how modern university lectures in

analysis for beginners should be held to the widely disseminated popular texts written by German-Jewish authors and the taking of positions in the cultural debates of the Weimar period. Related material in Section 3 – Places – expands the subject matter of this section.

Section 7 Anti-Semitism

Animosity toward Jews, which for centuries had been part and parcel of Jewish history, did not disappear after they had been granted legal equality. Anti-Semitism was just as likely to be present in the academic world of the Wilhelmine Empire and the Weimar Republic as it was in general society. This section depicts, on the one hand, the everyday anti-Semitism of the time, which affected all Jewish mathematicians in the period under examination and was expressed in prejudices and stereotypes, but also – as several documents presented in this section make very clear – in university appointment policies. Many of the exhibits included here are published for the first time. On the other hand, this section evokes the dramatic development from anti-Semitic stereotypes to the Nazi obsession with race. This trend can also be traced in mathematical culture – in documents, texts and actions, and not least of all in pamphlets published by adherents of the so-called “Deutsche Mathematik”.

Section 8 Dismissals and Exile

Section eight of the exhibition summarizes current knowledge about the persecution and expulsion of Jewish mathematicians that began in 1933. It recounts dismissals, emigration, flight and deaths. The manner in which the German Mathematical Society treated its Jewish members is also discussed. In the remainder of the section, the conditions encountered by refugees in their main countries of immigration are described briefly. Since all these topics can be no more than touched upon by the exhibition, the section also refers interested visitors to available sources and relevant research literature.

Section 9 Return? Jewish Émigré Mathematicians and Germany

This section addresses an issue which has received little attention in recent research, namely the possibilities – or in some cases the impossibility – for Jewish mathematicians to return to Germany after the downfall of the Nazi regime. In selected exhibits, it depicts the various, usually failed, efforts of Jewish mathematicians to return to Germany, as well as the few successful remigrations some years after the war. The section also illustrates some of the problems involved in reopening scientific communication between German mathematicians and the emigrants and their families in the years that followed the Holocaust.

Section 10 In Memoriam

The origins of the exhibition

This exhibition owes its existence to two independent impulses. First of all, some members of our team were confronted with the history of German-Jewish mathematicians while working on the edition of the *Collected Works* of the mathematician and writer Felix Hausdorff. This edition project, undertaken by the North Rhine-Westphalian Academy of Sciences and Humanities on the initiative of Egbert Brieskorn, raised questions concerning the general situation of German-Jewish mathematicians during the Wilhelmine Empire and the Weimar Republic. Was Hausdorff's impressive career a singular case? Did it follow typical career patterns, at least in some respects? To those involved in the project, the answer to both questions seemed to be yes. Yet, we noticed how little general historical literature there was on the activities of Jewish mathematicians in German-speaking academic culture. Considering that many of the leading German-speaking mathematicians of the late 19th and early 20th centuries came from Jewish families, this was quite surprising. Reinhard Siegmund-Schultze's monograph *Mathematicians Fleeing from Nazi Germany* had already comprehensively documented the flight and emigration of Jewish mathematicians from Germany and provided a basic summary of the known data about their persecution and deaths in Nazi Germany. Much less had been written on the life and work of German-Jewish mathematicians before 1933; a more thorough study of this period, therefore, appeared all the more important to us. Two students took the first steps in this direction. Helmut Berresheim began collecting certain data on German-Jewish mathematicians in the appendix to his Master's thesis on Hausdorff's work on divergent series, *Untersuchungen divergenter Reihen unter besonderer Berücksichtigung der Beiträge Felix Hausdorffs* (Bonn, 2002). Birgit Bergmann, in her Master's thesis, *Die Rolle jüdischer Mathematiker in der akademischen Öffentlichkeit in Deutschland von der 2. Hälfte des 19. Jahrhunderts bis zur Weimarer Republik* (Frankfurt/Main, 2006), on the role of Jewish mathematicians in the German academic public from the 2nd half of the 19th century to the Weimar Republic, systematically gathered information about Jewish mathematicians scattered in existing historical literature. She also analyzed their contributions to the debates on mathematics in the academic public of the Wilhelmine Empire and the Weimar Republic. Both theses underlined the strong commitment of German-Jewish mathematicians to the modernization of mathematics in this period, thus touching on the more general issue of the role of German Jews in cultural modernity, highlighted in work by Shulamith Volkov and others [see e.g. (Volkov 2006) and (Volkov 2000)].

Independently of this work, the Mathematical Institute at the University of Bonn suggested putting together an exhibition on the topic of Jewish mathematicians for the annual meeting of the German Mathematical Society in 2006. As the persecution and expulsion of Jewish mathematicians had previously been the subject of another exhibition – *Terror and Exile. Persecution and Expulsion of Mathematicians from Berlin between 1933 and 1945*, which was staged in Berlin in 1998 on the occasion of the first International Congress of Mathematicians to take place in Germany since 1904 – those responsible for Hausdorff's *Collected Works* suggested an exhibition focusing on the years before 1933. This idea converged with the work done in the studies mentioned in the last paragraph and thus found its way from the editorial office of the Hausdorff edition to the team which has put the present exhibition together.

A first version of the exhibition, displayed at Poppelsdorf Palace in Bonn in September 2006 for the annual meeting of the German Mathematical Society, was largely produced by the authors of this exhibition on their own. Geert Storbeck of the Bonn University Geographical Institute contributed the graphics and printed the original panels. The response to the exhibition was so positive that soon afterwards, in March 2007, it was put on display in the foyer of the Humboldt University in Berlin, this time on the occasion of the joint meeting of the German Mathematical Society and the German Society of Didactics of Mathematics.

In 2008, the Deutsche Telekom Stiftung provided financial support for a complete redesign of the exhibition. This second version (some photographs of it may be seen in this catalogue) traveled through Germany during the Year of Mathematics 2008 and has since been shown in many major German cities. The new concept and design were developed jointly with the Jewish Museum in Frankfurt and the company *init: feil und partner*, which took responsibility for both the design and the production of the new German version. In addition to the exhibition and catalogue, a German-English internet version can be found at www.juedische-mathematiker.de. It will be possible to update this internet version from time to time to present additional exhibits and materials on German-Jewish mathematicians.

The German version of the exhibition was well received in the cities in which it was shown. Many visitors of this second version as well as colleagues from several countries outside Germany raised the question of whether an international version of the exhibition might be feasible. With the support of three German ministries, the Federal Ministry for Education and Research, the Federal Foreign Office, and the Ministry of Science of North Rhine-Westphalia, an English version of the exhibition has now been produced. The exhibition has been re-designed once again, this time for an international public. The new design was developed by Atelier Markgraph, Frankfurt.

The topics dealt with in this exhibition are far from being exhausted. Much more, and more detailed, research into the role of Jewish mathematicians in German-speaking academic culture remains to be done. We hope that our exhibition can provide an interesting starting point.

Acknowledgements

First of all, we owe a debt of gratitude to the initiators and supporters of the various stages of our project. Among them are Werner Ballmann, organizer of the 2006 annual meeting of the German Mathematical Society in Bonn, Günter M. Ziegler, president of the German Mathematical Society and coordinator of the Year of Mathematics in 2008, Wolfgang Lück, president of the German Mathematical Society during the preparation of the international version, and Matthias Kreck, director of the Hausdorff Research Institute for Mathematics at this time. Matthias Kreck, Wolfgang Lück, and Günter M. Ziegler have also taken responsibility for planning an accompanying program of mathematical events during the first trip abroad, which will be to Israel in 2011 and early 2012. We are particularly grateful to Klaus Kinkel, president of Deutsche Telekom Stiftung, who has given strong support to our project from its first beginnings to the international version.

For scientific and curatorial advice given we are indebted to Ulrich Charpa (Leo Baeck Institute London), Reinhard Siegmund-Schultze (Agder College Kristiansand), Klaus Volkert (Cologne University), Ulf Hashagen (Deutsches Museum Munich), Michael Korey (Staatliche Kunstsammlungen Dresden), and Tzvi Langermann (Bar-Ilan University), as well as to Fritz Backhaus and Raphael Gross at the Jewish Museum Frankfurt.

Many of the photographs displayed in the exhibition come from two sources in particular: the George Pólya picture album, in the possession of Dr. Gerald L. Alexanderson, Santa Clara University, California, and the photographic collection of the Oberwolfach Mathematical Research Institute. We are greatly indebted to both for permission to use the photographs.

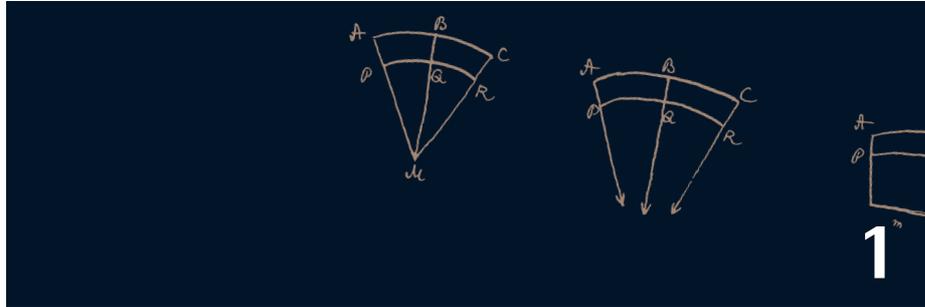
We owe particular thanks, furthermore, to the following archives and university libraries: Universitäts- und Landesbibliothek Bonn, Niedersächsische Staats- und Universitätsbibliothek Göttingen, Universitätsarchiv Freiburg, Archiv der Humboldt-Universität zu Berlin, Universitätsarchiv Frankfurt and Archiv des Springer Verlags Berlin. Early in the project, we wrote to all the archives of the German universities and mathematics institutes where the mathematicians listed in section two had been active, requesting information about archival materials on these individuals. We received many helpful answers. The information thus obtained is presented in the index of archival holdings at the end of this volume. We would like to thank all those who responded. For the exhibition's book display we gratefully acknowledge the friendly support of the antiquarian Gerhard Renner (Albstadt).

We must also thank Springer, the scientific publishing house, for kindly publishing the German and English versions of the exhibition catalogue, and in particular Joachim Heinze and Clemens Heine. Nicole Gentz has been extremely helpful in editing the English version of the catalogue, and we offer our sincere thanks for her patience and precision in revising both the text and the translations of documents shown in the exhibition. Finally, we owe a debt of gratitude to the secretaries and student assistants without whose active involvement this traveling exhibition could not have been realized. Those involved in various phases of the project include Uta Brucker and Judith Delombre in the secretariat of the History of Science group at Frankfurt University; Björn Buxbaum-Conradi, Lisa Haag, Martin Herrnstadt, Timotheus Kartmann, Dominik Kauss, Philipp Kranz, Iris Pfliegensdörfer, Amos Schindler, Dorothea Wolkenhauer (all from Frankfurt) and Frithjof Kurtz (in Bonn).

Moritz Epple



Education of Jewish boys



From Exclusion to Acceptance, from Acceptance to Persecution

The exhibition “Transcending Tradition: Jewish Mathematicians in the German-Speaking Academic Culture” illustrates the personal and professional lives of Jewish mathematicians, presenting typical places where they lived and worked and familiarizing visitors with their mathematical achievements, their books and publications, and their participation in professional organizations like the German Mathematical Society. Because of the long history of exclusion of Jewish scientists and mathematicians from the academic world, our overview does not begin until about 1820. Carl Gustav Jacob Jacobi (1804-1851) was the first Jewish mathematician to be granted a professorship at a German-speaking university. In 1827 he was appointed Extraordinarius and in 1832 full professor at the University of Königsberg (now Kaliningrad, Russia). He had, however, already converted to Christianity by the time these appointments were made. This essay will illustrate why conversion seemed to be necessary, why Jewish mathematicians did not begin to appear at German universities until after 1820, and what the general circumstances were for them in the German-speaking academic world. The essay will also describe the ongoing discrimination of Jewish university students. German universities were slow to open their doors to Jewish students, who even then remained confronted by the negative attitudes of Christian students, professors and officials and by the omnipresence of stereotypes and discrimination. Looking back, these decades of the mid-nineteenth century can be described as a period of transition from exclusion to acceptance, but nevertheless as a period in which discrimination never fully disappeared.

$$f(x) = \prod_{n=1}^{\infty} \left(1 - \frac{\lambda \sigma^n x}{1 - \sigma^n x}\right) = \prod_{n=1}^{\infty} [1 - (\lambda+1)\sigma^n x] : \prod_{n=1}^{\infty} (1 - \sigma^n x)$$

Jewish mathematical life before emancipation



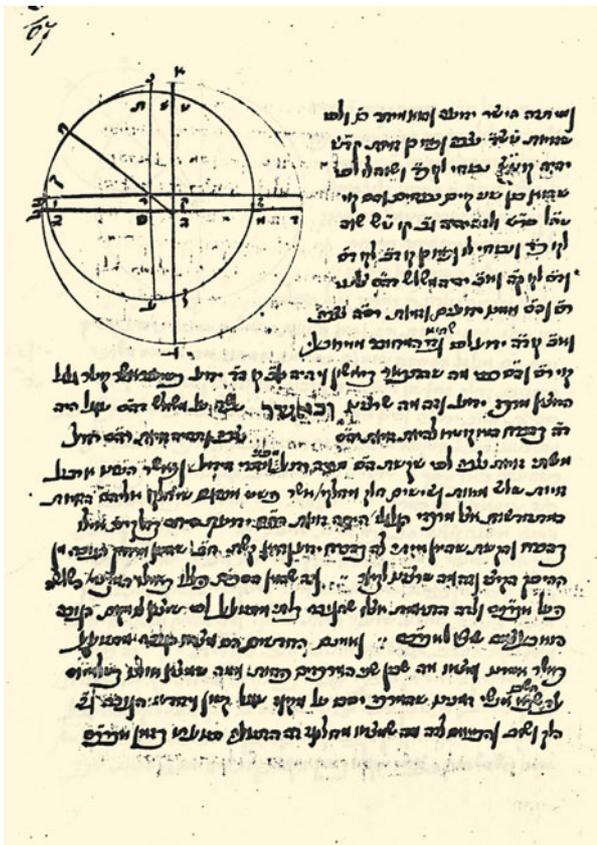
Moritz Steinschneider

Our exhibition spans a time period of approximately 150 years, from the time of the French Revolution to 1945. There had, of course, been Jewish scholars in German-speaking areas who had been interested in mathematics hundreds of years before, indeed as long as they had been allowed to live there. Jewish mathematicians worked within their own communities, excluded from the academic world, hardly noticed, to say nothing of respected or acknowledged, until the universities began accepting Jewish students. In the late 19th century, when the Hebrew scholar and bibliographer Moritz Steinschneider (1816-1907) published several articles about mathematical research done by Jewish scholars from the time of the Talmud until 1787, these works were familiar only to a handful of specialists who were able to read Hebrew. For more than 50 years, Steinschneider had been collecting information about manuscripts and authors, overwhelmed by the wealth of material he wanted to describe and worried that he might not manage this task in his own lifetime.¹ Steinschneider also looked into the reasons for the interest of Jewish scholars in mathematics: "If Jews were seen to be involved in any intellectual pursuit which was not directly linked to the Bible or did not appear to be so, then it was

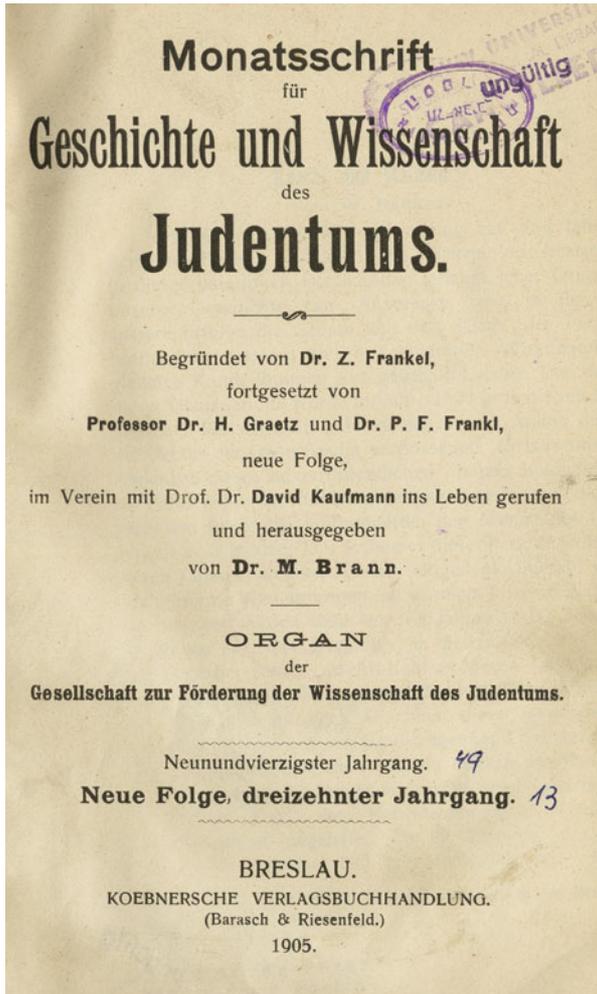
thought necessary to trace this activity back to the only occupations which were permitted to the Jews in the Middle Ages (and indeed only in certain areas) ... namely trade, usury, and healing."² In the foreword to his collection of old manuscripts on mathematics, he answered this question in a different way, explaining: "It will be seen that the Jews preferred to focus on astronomy and the closely related field of astrology, the more distant disciplines of geometry and algebra, as well as arithmetic. When have the merchants and usurers of a nation been so bold as to tackle the most difficult problems of mathematics?!"³

Jewish mathematicians first appeared in the world of German-speaking universities around 1800. Until this time, Jewish mathematicians had debated, researched and published only in their Jewish communities - from Hamburg to Bavaria, from Vilnius to Cologne. The surrounding Christians often viewed them with hostility, or at the very least with suspicion.⁴ Many Jewish thinkers and philosophers, physicians and alchemists, Talmudic scholars and rabbis as well as teachers at yeshivas and Talmudic schools dealt with mathematics as an integral part of their work, particularly if their scientific interests were closely related to the ex-

act sciences. Moreover, beginning in the 10th century, Jewish scholars had been actively involved in translating mathematical and scientific manuscripts, for the most part from Arabic into Hebrew and Latin. Since many ancient Greek scientific texts had been preserved only through Arabic translations, the translations into Latin played an important role in bringing both ancient and Islamic mathematical knowledge to Europe. This culture of translation was particularly lively in places



A page from the "Epitome of the Almagest" by Ibn Rushd (Averroes). The Arabic original has been lost, and only the Hebrew translation survives.



sicher; in Note 3 f. 15 b wird das Datum 3547 (1587) angegeben.

1602 verfasste der gelehrte Moses Mizurudi משה מצות משה über die Neumondberechnung, ms. in Leyden 52¹⁷; die Beschreibung im Katalog p. 244 beutet Fürst (Karäer III, 18) in seiner Weise aus. Gottlob, בקרת Seite 204 (eigentlich 194), hält alle Schriften des Verfassers für verloren, während auch משה ימין über den Pentateuch, vielleicht so weit es verfasst war, im Autograph erhalten ist, ms. Fischl 9 (Neub. 2347); vergl. auch Harkavy und Strack, Katalog I., 30; Harkavy, Altjüdische Denkmäler Seite 81, 281.

1606 redigierte ein Anonymus die עברונות in ms. Oppenh. 1667 Qu. (Neub. 2074). Ich habe in Oxford Folgendes notiert. Anf. תשובת ופולות ומולות וציה הקביה עלינו להשוב תקופת ומולות במסי שבת כדאמרין במסי שבת כגון עתה f. 2 כגון עתה f. 2. Enthält Tabellen und bewegliche Räder בשנת שמיז לפי שירוש על היד (שערים) לוחות 14 und den חרוז des Saadja Gaon f. 36 b.

1607 verfasste ein Anonymus, welcher wegen der Pest aus Prag nach Köln geflohen war, einen Kommentar zu Maimonides, פירוש החדש mit geometrischen Figuren, ms. Oppenh. 589 Qu. (Neub. 746⁴). Das Zitat Mord. יסה bezieht sich ohne Zweifel auf לבניש, s. oben S. 93 f.

Vorangeht (in verschiedener Schrift, Neub.³, (ob von demselben Anonymus?) die Abschrift eines Kommentars über Stellen der Kosmographie des Abraham bar Chijja (פירוש צורת הארץ), bis Abschnitt IX (פתח מ' י"ז), welcher am Rand seines ms. der Kosmographie geschrieben war und von demselben Anon. ergänzt wurde (f. 360—80). Neub. bemerkt: Der Verfasser (der Ergänzung?) zitiert seinen פ"ק וישי החדש Kapitel 12. Dies Zitat wäre also in dem oben erwähnten Kommentar in diesem ms. zu suchen, jedenfalls Genaueres

¹) Was bedeutet ישי?

where the different traditions interacted, such as the city of Toledo in Spain or the court of Frederick II in Sicily.⁵

Title page and excerpt from one of Steinschneider's texts

Steinschneider emphasized that the 12th century had been “decisive for the general development of European civilization as a result of the translation of Arabic scientific texts that were themselves based on the works of the ancient Greeks. Jews had a share in this activity. Alongside the first translator we also find a Jewish mathematician, Abraham of Barcelona, who for the benefit of his fellow Jews in neighboring areas who knew no Arabic clad Arabic mathematics and astronomy texts in a Hebrew garment which a Christian colleague then replaced by a Latin one. Soon thereafter, the fanaticism of the Almohads drove out a number of Jewish scholars into Christian areas. Thanks to their own texts and to Hebrew translations of Arabic manuscripts, these scholars contributed to the spread of hitherto unknown concepts and findings and of new terms to describe them.”⁶

A substantial part of Arabic, Hebrew and Latin mathematical work of this period relates to astronomy. It is hardly surprising that Jews should be particularly interested in astronomy, given that the Jewish calendar necessitates special calculations. Since the Jewish year is based on the motion of the moon, the length of the calendar year varies, with an “intercalary” month added every few years.⁷

1 See (Steinschneider 2001 [1901]: 20, 211). On Moritz Steinschneider, see (Kohut 1896) as well as (Steinschneider 1995) and (Figeac 2007).
 2 (Steinschneider 2001 [1901]: 21).
 3 Ibid.: 22.
 4 On the activities of Jewish scholars, see (Richardz 1974), (Tourey 1986), (Dann 1986). On Jewish mathematicians, see (Steinschneider 1893, 1901, 1899 und 1905) as well as (Steinschneider 2001 [1901]).
 5 See (Langermann 1999).
 6 (Steinschneider 2001 [1901]: 82–83).
 7 On the Jewish calendar, see (Basnizki 1998). Until his dismissal, Ludwig Basnizki (1885–1957) was a mathematics teacher in Heidelberg. He wrote a book about the Jewish calendar which was still published in 1938 in Nazi Germany. A year later, he managed to flee to Brazil via Switzerland.

Steinschneider described the reasons why Jewish scholars engaged in mathematics as follows: "The real motives are to be found in the texts themselves, and if Jews' special inclination for and skill in mathematics is based on their external history, then it is the very and complete absence of any writings on mechanics that puts us on the right track. People who are excluded from public life, partially from social life (the latter also through certain laws regarding public ceremonies), naturally turn toward more *abstract* objects; Russian Jews today still gladly work on the invention of the calculator and not a few Jews are among the stars in the unprofitable art of chess, hence abstract combinations."⁸ As a special motive for mathematical research Steinschneider emphasized the calculation of the Jewish calendar. Special difficulties were associated with the exact determination of Passover (much in the same manner as the Christian calendar required sophisticated calculations for

Jewish Calendar



8 (Steinschneider 2001 [1901]: 22).

Easter). Any interaction between Jews and Christians also required calculations to ‘translate’ the days, months and years of the Jewish calendar into Julian and, after 1582, Gregorian dates.⁹

General conditions for Jewish mathematicians

How Jews lived in Europe depended strongly on the policies of the Christian majority, even if these were not related directly to Jews. External political circumstances determined Jewish life for centuries, mostly in a negative way with rules intended to distinguish, separate and exclude. Even when they were not facing physical threat in the form of persecution or pogroms, Jews were forbidden to live in many towns and villages, or forced to live in certain quarters, and in many towns their numbers were restricted. They had to pay more taxes than their Christian neighbors. Furthermore, Jews were barred from most professions, could not travel freely and were excluded from political participation. Their political and legal conditions changed over time and varied depending on their countries or areas of residence; in all places Jews – and even those families which for one reason or another were granted residence rights – depended on the religious and political authorities for their protection. Jewish lives were always in danger: at any moment a pogrom could break out, at any moment they could be forced to leave.

Thus for centuries Jewish mathematicians were often only able to work in secrecy and isolation. Constant persecution and discrimination made it impossible for more than a few among them to find recognition. Steinschneider, a scholar who was fluent in at least eight languages (Hebrew, Greek, Arabic, Latin, German, English, French, and Italian), had to repeat again and again that biographical information about a particular author was “very small because Jewish authors led very quiet scholarly lives, if they were not driven away by persecution or hardship.”¹⁰ Even during the so-called period of Enlightenment in the 18th century and under princes and kings who considered themselves enlightened, information on the lives of Jewish mathematicians remains very scarce. In this period, the gap between Jewish mathematical scholarship and the rapid general development of mathematical sciences in Europe widened, not least because Jewish scholars were still not free to participate in the academic life of the society in which they lived.

What political and legal conditions were necessary for Jewish mathematicians to come to the attention of their Christian colleagues? When were they finally allowed to enter institutions such as academies and universities? When were they allowed to teach and do research under equal conditions? Indeed, did equal conditions ever really apply?

Persecutions and forced conversion

For centuries Christians attempted to force Jews to abandon their religion and convert.¹¹ But although conversion often seemed to be a chance to avoid discriminatory practices and solve the problem of isolation and exclusion, it was by no means the key to acceptance into the Christian community. For many Jews, baptism represented a betrayal of the Jewish people, the religion, family and friends. On the other hand, forced conversions had been a familiar component of Jewish history since

⁹ As an example: the year 5771 comprises the period from September 2010 to September 2011; the following year, 5772, begins on September 29, 2011.

¹⁰ (Steinschneider 2001 [1901]: 32).

¹¹ For the 18th century, see the dispute with Johann Caspar Lavater (1741–1801), a Swiss priest who first admired Moses Mendelssohn but who in 1770 publicly called for his conversion, an action that hurt Mendelssohn deeply. On this debate, in which Mendelssohn was supported by Gotthold Ephraim Lessing and Immanuel Kant, among others, see in particular (Altmann 1973); see also (Schulte 2002), (Knobloch 1979).

the beginning of the Diaspora. Steinschneider avoided addressing the problem of conversion in his articles by using the term “oriental authors” instead of “Jewish converts” for Jewish scholars who had converted to Islam. He referred to converted Jews as “Jewish scholars” only if it was known that they had grown up in Jewish families. He was not able to follow this practice consistently. His ideas regarding conversion in the medieval period echoed the attitudes of his own time, while at the same time showing the difficulties of ascertaining the role of Jewish scholarship in the history of the sciences: “In addition to Arab science, Jews also began to be interested in Islam. It is neither easy nor rewarding to seek the motives which underlie religious conversion: love, ambition, self-interest, indifference toward one’s own religion and similar issues certainly played a role for most renegades, or proselytes, with the occasional exception of new beliefs gained at a mature age. All we seek here is an answer to the general question: *do Jews who have left the community still belong to Jewish history?* Usually we distance ourselves from Jews by birth, who were led to the new religion by parents or others. On the other hand, it is certainly not an objective historical approach which, in the case of Jewish converts, places responsibility for the negative elements of the personality on their ancestry. In cultural history, therefore, the question is whether or not a specific scholar received his initial education under Jewish influence. This, however, cannot be proven in all cases, at least for Jews who were living among Arabs, about whom we can often get information only from Arabic sources.”¹²

As a result of incessant persecution, Jews were forced to move from one place to another, sometimes escaping with not much more than their lives. In the course of these migrations, two major groups of Jews settled in different countries. Those who were driven out of Spain and Portugal in the 15th century, the Sephardic Jews, resettled mostly in the Netherlands, in the northern German states, in France, Italy and the Ottoman Empire. Jews who were chased out of German-speaking areas in the Middle Ages, as crusaders marched through Europe, escaped to Eastern Europe. The Ashkenazi Jews spoke a dialect of medieval High German that gradually integrated Hebrew and Slavic elements (mostly Polish, Russian and Ukrainian) to create Yiddish. Yiddish became the language most Jews in Central and Eastern Europe read and spoke until the Holocaust. Most of the mathematicians mentioned in this exhibition came from Ashkenazi families.

Equality: *de jure*, not *de facto*

The French Revolution of 1789 played an enormous role in Jewish history in Europe. For the first time, Jews in France became citizens with equal rights. Unlike the new nation state in France, the German territories at this time remained divided in various larger and smaller states (until the German unification in 1871). French law was introduced in the areas that were temporarily occupied by Napoleon (particularly along the Rhine), but it was later repelled as these territories fell back to German control. It was to take more than another 50 years – until 1848 – until Jews finally attained legal equality in the German states. But even then this equality was often merely on paper, and actual developments proceeded along quite different lines.¹³ The legal equality of Jews, which began in 1812 with the Prussian Emancipation Edict and improved as a result of the Revolution of March 1848, was an equality that can only be described as *de jure*, not *de facto*. In academic life, it did not lead to Jews being appointed professors on an equal basis with Christians. Discrimination

¹² (Steinschneider 2001 [1901]: 49).

¹³ (Richarz 1974), (Schuder 1989), (Touy 1972) and (Kalisch 1860). Among the rich literature on modern Jewish history the work of Simon Dubnow (Dubnov) (1860–1941) should receive particular attention. See (Dubnov 1925), (Elbogen 1930).

Das Edikt vom 11. März 1812 bestimmt

§. 1.

Die in Unseren Staaten jetzt wohnhaften, mit General-Privilegien, Naturalisations-Patenten, Schutzbriefen und Concessionen versehenen Juden und deren Familien sind für Einländer und Preussische Staatsbürger zu achten.

§. 7.

Die für Einländer zu achtenden Juden hingegen sollen, insofern diese Verordnung nichts Abweichendes enthält, gleiche bürgerliche Rechte und Freiheiten mit den Christen genießen.

§. 8.

Sie können daher akademische Lehr- und Schul- auch Gemeinde-Aemter, zu welchen sie sich geschickt gemacht haben, verwalten.

§. 9.

In wiefern die Juden zu anderen öffentlichen Bedienungen und Staats-Aemtern zugelassen werden können, behalten wir Uns vor, in der Folge der Zeit gesetzlich zu bestimmen.

The Prussian "Jewish Edict" of 1812

Publikandum vom 4. Dezember 1822.

Se. Majestät der König haben durch Höchste Kabinets-Ordre vom 18. August d. J. die Bestimmung des Ediktes vom 11. März 1812 §§. 7 und 8,

wonach die für Einländer zu achtenden Juden zu akademischen Lehr- und Schulämtern, zu welchen sie sich geschickt gemacht haben, zugelassen werden sollen,

wegen der bei der Ausführung sich zeigenden Mißverhältnisse, aufgehoben, welches hierdurch bekannt gemacht wird.

Berlin, den 4. Dezember 1822.

Königliches Geheimes Staatsministerium.

v. Boß. v. Altenstein. v. Kirchheim. v. Bülow. v. Schuckmann.
v. Lottum. v. Klewiz. v. Hake.

Partial annulment of the "Jewish Edict" in 1822

continued even after the unification of Germany in 1871, in the course of which legal equality for Jews was extended to the new Empire as a whole, and it remained very rare for Jewish academics to be appointed professors.

Conversion sometimes, but not always, presented an option for career advancement. As Heinrich Heine once said, the certificate of baptism was the "entry ticket into European culture".¹⁴ An outright "epidemic of baptisms" took place in Prussia between 1820 and 1830, the result of the discrimination felt by Jews in most professions. Looking back, Jacob Jacobson described the situation in Prussia as follows: "The Emancipation Edict might have provided access to positions at schools

14 "Der Taufzettel ist das Eintrittsbillet zur europäischen Kultur", see (Heine 1976). Heine's own conversion, however, did not help him much; he had hoped for a position in civil service, which he never obtained.

and academic institutions as well as positions in local administration offices, but the decision about whether Jews would also be granted access to other public services and government positions was reserved for later regulations (Sections 8 and 9 of the Edict). This delayed decision had been a concession to those ministers and advisors who had not been able to decide in favor of such a radical change in existing practice. Their opinions now took on increased weight, and the king decided that in a Christian state only those who professed the religion of the state could exert true administrative power. The Cabinet Order of 18 August 1822, therefore, excluded those who remained Jewish from any academic career path, a decision that led to many baptisms.¹⁵

Jews were given legal equality in Prussia after the March Revolution of 1848. The new constitution of 1850 granted civil rights to all citizens independently of their religion. Nevertheless, discrimination of German Jews continued, and restrictions and limitations remained in place. Their equality was only *de jure*, not *de facto*. This remained true even after the introduction of the federal constitution of July 1869, which lifted previous “restrictions of the rights of citizens and residents based on the various religious denominations”.¹⁶ After the unification of Germany in 1871, the new constitution of the Wilhelmine Empire adopted elements of the 1850 Prussian constitution and of the federal constitution of 1869 on the rights of citizens independently of their religion. The constitution of the Weimar Republic, proclaimed in 1919, was based on the constitutions of 1850 and 1871. The main changes from earlier constitutions concerned the type of government, which was now a parliamentary democracy and a republic rather than a constitutional monarchy. Many other details, including the regulations for Jews, remained unchanged.¹⁷

The situation of Jewish scholars changed only little in the years between 1848 and 1933, despite the regulations in the various German constitutions. During the Weimar Republic, there were isolated improvements, for example at universities, where religion no longer had to be mentioned in the curriculum vitae that had to be published in dissertations.¹⁸ Although religion officially no longer played a role, from 1930 onwards it once again became difficult for Jews even to find jobs.¹⁹ The situation of Jewish mathematicians remained problematic throughout the Weimar Republic. There were important intellectual successes and hopes in academic life, but on the other hand Jews still had to cope with fears and threats, desecration of cemeteries and physical attacks. Because the federal principle continued to apply to schools and higher academic institutions during the Weimar Republic, the status of Jewish mathematicians differed in the various German states. To a certain extent and in some locations and cities there was a remarkable flourishing of German-Jewish cultural and intellectual life. At the same time anti-Semitic hostility increased and universities ignored Jewish mathematicians when full professorships were offered.

15 (Jacobson 1962: 16). Dr. Jacob Jacobson (1888–1968) was head of the Archives of German Jews (*Gesamtarchiv der deutschen Juden*). As a historian he was intimately involved in the collection and evaluation of historical sources on German Jews. His publications after 1945 became possible only because his wife and son had taken his papers with them to Great Britain when they went into exile. He survived the Theresienstadt concentration camp. In 1945 he was able to join his family to London, where he then worked at the Leo Baeck Institute.

16 (Jacobson 1962: 45).

17 Section 3 of the second main part of the Weimar constitution dealt with “religion and religious organizations” as described in articles 135 to 141. Article 141 of the Weimar constitution became an element of the constitution (*Grundgesetz*) of the Federal Republic of Germany.

18 This was based on the Weimar constitution, article 136 (3), according to which no one was required to make their religious convictions public, except for statistical surveys.

19 See the anonymous essay “Probleme der Berufswahl” [problems in choosing a profession] in *Jüdisches Adressbuch* 1931: 42–43).

Advancement through education

Education is one of the most important traditions in Jewish life. Jewish boys began to read and write Hebrew as early as three, and because of this tradition most were literate in at least Hebrew and Yiddish. At the same time, they often learned the language of the region and of the country in which they lived; thus German became one of the languages many Jews learned in several areas of Middle and Eastern Europe that belonged to the Kingdom of Prussia or the Habsburg monarchy.

Jews were not allowed to study at universities in German-speaking areas until 1678, and even then their access to higher education was patchy at best: university access depended on the policies of each German state and on how their authorities related to “their” Jews.²⁰ For historic reasons, Prussia played a relatively positive role in this context, and therefore many of the examples featured in the exhibition are related to Prussia.

The opening of the universities

The opening of universities to Jews was not an acknowledgment of equality for all citizens regardless of religion, but rather the result of efforts by authorities to exert influence in Jewish communities. Thus, the authorities required physicians and rabbis who were employed by Jewish communities to hold doctoral degrees, and consequently Jews who wanted to become rabbis or doctors had to attend university, so that in many universities the faculties of philosophy and medicine were the first to admit Jewish students. The universities, however, were prepared to enroll Jewish students only under protest. At many universities, for example at Königsberg, tuition for Jewish students was twice what non-Jewish students had to pay.

Monika Richarz investigated in great detail the exact dates when Jews were allowed to study medicine, philosophy and other disciplines in the German states, when they were allowed to receive doctoral degrees and write their habilitation, and when they were appointed full professors. There were significant differences between the different German states and their universities concerning which disciplines were accessible to Jewish students. The first Jew who received a doctoral degree in medicine was a student at the University of Frankfurt an der Oder in 1721. The first doctoral degree in law awarded to a Jewish student was in 1799 from the University of Göttingen. The first doctoral degree granted by a philosophical faculty, which at the time included mathematics and science, was finally awarded nearly one hundred years after the first degree in medicine, in 1817. At the University of Halle, for example, at least 28 Jewish students received doctoral degrees between 1817 and 1848, eighteen of which were candidates who wrote on oriental or biblical topics and only two of which were in mathematics.²¹

The process of opening universities to Jewish students was far from being a story of straightforward successes. On the contrary: it was often characterized by setbacks and interrupted by anti-Semitic campaigns and pogroms. In early August 1819, for example, students at the University of Würzburg carried out pogrom-like attacks on Jewish residents and students; similar pogroms soon broke out in Heidelberg, Karlsruhe and other cities as well. Jews were hunted down with the notorious “Hep

²⁰ On this development, see (Richarz 1974).

²¹ See (Richarz 1974).

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Gesetz-Sammlung

für die
Königlichen Preussischen Staaten.

— Nr. 30. —

(Nr. 2871.) Gesetz über die Verhältnisse der Juden. Vom 23. Juli 1847.

Wir Friedrich Wilhelm, von Gottes Gnaden, König von Preußen u. u.

Nachdem Wir zur Herstellung einer möglichst gleichmäßigen Gesetzgebung über die Verhältnisse der Juden die in dieser Hinsicht bestehenden Vorschriften einer Revision haben unterwerfen lassen, verordnen Wir, nach Anhörung beider Kurien Unserer zum ersten Vereinigten Landtage versammelt gewesenen getreuen Stände, auf den Antrag Unseres Staatsministeriums, was folgt:

T i t e l I.**Bürgerliche Verhältnisse der Juden.****§. 1.**

Unseren jüdischen Untertanen sollen, soweit dieses Gesetz nicht ein Anderes bestimmt, im ganzen Umfange Unserer Monarchie neben gleichen Pflichten auch gleiche bürgerliche Rechte mit Unseren christlichen Untertanen zustehen.

A b s c h n i t t I.

Bestimmungen für alle Landestheile, mit Ausschluß des Großherzogthums Posen.

§. 2.

Zu einem unmittelbaren oder mittelbaren Staatsamte, sowie zu einem Kommunalamte kann ein Jude nur dann zugelassen werden, wenn mit einem solchen Amte die Ausübung einer richterlichen, polizeilichen oder exekutiven Gewalt nicht verbunden ist.

Außerdem bleiben die Juden allgemein von der Leitung und Beaufsichtigung christlicher Kultus- und Unterrichts-Angelegenheiten ausgeschlossen.

An Universitäten können Juden, soweit die Statuten nicht entgegenstehen, als Privatdozenten, außerordentliche und ordentliche Professoren der medizinischen, mathematischen, naturwissenschaftlichen, geographischen und sprachwissenschaftlichen Lehrfächer zugelassen werden. Von allen übrigen Lehrfächern an Universitäten, sowie von dem akademischen Senate und von den Aemtern eines Dekans, Prorektors und Rektors bleiben sie ausgeschlossen.

Jahrgang 1847. (Nr. 2871.)

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An

Ausgegeben zu Berlin den 5. August 1847.

Hep” calls.²² When public authorities in one place annulled a prohibition or removed a hurdle, sooner or later a new prohibition was ratified or a new hurdle established. For example, although the Prussian Edict of 1812 granted Jews civil rights, these rights were gradually withdrawn a few years later. From 1822 onwards, habilitation (a postdoctoral qualification for scientific research, usually coupled with the *venia legendi*, i.e. the right to teach at a university), was once again possible only for baptized Jews. This new order was called “Lex Gans” after the student Eduard Gans (1798-1839), who was forbidden to habilitate at Berlin University without converting. When he applied for a position as full professor in 1822, the order allowing Jewish scholars into such positions in exceptional cases was once again repelled. In 1825, Gans converted to Protestantism and in 1826 he was appointed Extraordinarius of law at Berlin University. He finally became full professor in 1828.

²² On the attacks on Jewish students in university cities in August 1819, see (Richarz 1974: 111-112, 119-120).