Jews and Science in German Contexts

Edited by ULRICH CHARPA and UTE DEICHMANN

Schriftenreihe wissenschaftlicher Abhandlungen des Leo Baeck Instituts 72

Mohr Siebeck

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Jews and Sciences in German Contexts

Case Studies from the 19th and 20th Centuries

edited by

Ulrich Charpa _{and} Ute Deichmann

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In 2003 the Leo Baeck Institute in London (LBI) established a long-term project aimed at documenting and explaining the role of Jews in Germanspeaking academia during the nineteenth and twentieth centuries. From the beginning this project has been carried out in cooperation with the Sidney M. Edelstein Center for the History and Philosophy of Science, Technology and Medicine at the Hebrew University of Jerusalem. It is also closely connected to the Modern Jewish History, Culture, and Thought programme at the University of Sussex which gave the LBI an opportunity to integrate the topic into an educational framework. The project received its initial impetus from an exchange with Dan Diner (Jerusalem and Leipzig) which led to a conference organised by the Simon Dubnow Institute, Leipzig, in 2002, and the publication of a special section on science and the Jews in that institute's 2004 Yearbook. Apart from the editors, two other participants of the first meeting in Leipzig, Ruth Lewin Sime and Anthony S. Travis, contributed to the current volume. Other articles by members of the LBI research project have appeared recently in various journals and collected volumes. The present book is the first "home-publication" of the project and we owe great thanks to our colleagues at the LBI, especially Gabriele Rahaman for her careful editing of the articles, and the editors of the Schriftenreihe wissenschaftlicher Abhandlungen des Leo Baeck Instituts, John Grenville and Raphael Gross, for their advice.

In connection with the LBI project four workshops were organised, three in Jerusalem (one in 2003 and two in 2006) and one in Brighton (2004). The project is an integral part of current developments in the field of Jewish Studies as well as that of history and philosophy of science. As to the first, this is reflected in the foundation of Aleph - Historical Studies in Science & Judaism in 2001, an annual journal edited by Gad Freudenthal and published by the Edelstein Center at the Hebrew University. Aleph is devoted to the exploration of the interface between Judaism and science. Its appearance provided the motivation for a serious engagement with questions related to Jews and the sciences, especially since Aleph also publishes scholarly pieces on modernity by authors such as David Hollinger and Shulamit Volkov. However, the main emphasis has been on the mediaeval period, since here the interrelations are more clear-cut because Jewish proto-scientists and

scholars can be primarily conceived of as Jews who connect their scholarly work with religious or theological attitudes. In the realm of modernity, however, with scientists becoming increasingly secular, attempts to create a relationship between Judaism and science pose a problem. The current volume addresses these difficulties at various levels by, for example, reconstructing the way in which Jewish scientists were concentrated in particular disciplines as well as by analysing practical and intellectual issues, emphasising certain ways of practising science, and looking at the methodology and metaphysics of science.

In contrast to most of the increasing number of biographical studies related to German-Jewish scientists in the nineteenth and twentieth centuries, the emphasis here is on their science. The authors examine the relationships between the cultural and social situations on the one hand and various scientific activities on the other. The contributions document general tendencies as well as individual cases of research practices, achievements, attitudes and biases of Jewish scientists mostly in Germany and Austria but also in the United Kingdom and Palestine/Israel. At the same time, attitudes of non-Jews towards Jewish scientists are also considered.

The focus of the first section is on research practices, achievements, and their background.

Ute Deichmann analyses the work of Ferdinand Cohn, one of the founders of microbiology in the late nineteenth century. It is argued that the value which he attributed to empiricism, to the knowledge of literature in the field, to the outstanding research by others, his readiness to criticise and reject claims, and his predilection for reasoning can be related at least to some extent to his experience of the "testimonial" Jewish traditional education in his youth. In addition Deichmann draws attention to the possibility of drawing parallels between Cohn's predilection for "discreteness" in nature – the individuality of bacterial strains – and the primarily legislative character of the Jewish religion and its classificational basis. This leads to the general problem of whether experience in religious practices may have at least in some cases contributed to a researcher's predilection towards certain principles and methodologies in science. Questions of this type have been discussed extensively with regard to Newton and others, and there is thus every reason not to neglect them in this field.

In common with microbiology, chemistry was an area in which Jews played a major role in the nineteenth century. By focussing on Raphael Meldola, grandson of a chief Sephardi rabbi in London, and president of the British Chemical Society, who emphasised the achievements of German chemists in the English-speaking world, Anthony Travis explores the over representation of German-Jewish chemists and entrepreneurs in the dyemaking industry. He relates their success to craft skills, developed for centu-

ries in the Jewish communities, to existing occupation patterns as well as to new opportunities and restrictions on academic advancement. At the turn of the nineteenth to the twentieth century Jews were still among the most prominent contributors to chemistry in Germany.

Moritz Epple's article deals with the early activities in applied mathematics, literature and philosophical criticism of Felix Hausdorff, who (under the pseudonym of Paul Mongré) was a radical, Nietzsche-inspired critic of metaphysics and also a modernist mathematician engaged in set theory. Epple argues that the style of Hausdorff's later ground-breaking mathematical work was influenced significantly by his earlier intellectual outlook, with both being at quite a distance from cultural and scientific mainstream traditions in nineteenth century Germany. Whereas some aspects of Hausdorff's professional career can be easily related to his Jewish background, the question of whether or not, and to what extent, this background contributed to his remarkable – and in many ways singular – intellectual output remains an open question.

Deichmann's second contribution distinguishes between two different ways of working in biochemical research in early twentieth century Germany and analyses the backgrounds to both. She portrays Leonor Michaelis and his work as the representative of a group of highly successful, mainly Jewish, scientists who by a unique combination of (quantitative and exact) empirical research and theorising, as well as by possessing the abilities to bridge various scientific fields, became leading figures in novel research at the interface of medicine, biology and chemistry, in particular immunology, enzymology and intermediate metabolism. Emil Abderhalden here represents the majority of German – Jewish and non-Jewish – medical biochemists whose work was less scientific, lacking in rigorous experimentation and emphasising strongly medical application and concepts of colloidal chemistry.

The main theme of the second section of this volume is the impact of religious and ideological attitudes on scientific research and acceptance in society.

Raphael Falk portrays three Zionist scientists in the first decades of the twentieth century, Shneor Zalman Bychowski, Redcliffe Nathan Salaman, and Fritz Shimon Bodenheimer. Despite their very different religious and social backgrounds, they shared the seemingly contradictory aims of reestablishing a biological entity "Jew" while promoting universal humanistic values at the same time. Falk claims that this humanistic version of nationalism also allowed practising Zionists to maintain explicit racial and eugenic notions in spite of the developments in Nazi and post-war Germany.

Nurit Kirsh analyses the influences of Zionism as well as those of German antisemitic traditions on the research in human population genetic conducted by three Israeli researchers who were former German or Austrian citizens, namely the physicians Chaim Sheba and Joseph Gurevitch and the geneticist Elisabeth Goldschmidt. Whereas their research complied with international scientific standards, the explanations they put forward were biased by virtue of excluding conclusions at variance with accepted Zionistic views. Thus differences between Ashkenazi and Oriental Jews were established, but, in accordance with the Zionistic ethos and German antisemitic traditions, they were also interpreted by the researchers according to the idea of a common biological origin of all Jews.

Yael Hashiloni-Dolev draws on her extensive study of attitudes towards reproductive genetics in Israel and Germany when examining the impact of religious cultures on the practical implementation of this science. She shows that Jewish and Christian religious understandings of abortion, eugenics, disability, suffering, and interference with nature (or God's creation) are relevant to the ethical dilemmas related to reproductive genetics in both countries, and even among citizens who claim to be secular. Whereas Jewish culture in Israel stresses the potential blessings of reproductive genetics, Christian culture in Germany emphasises its potential moral burdens, since it "plays God", has no respect for foetuses, and denies the value of suffering.

Ulrich Charpa attempts to shed new light on the question of Einstein's "Jewishness" as a scientist. He examines the view that most of what is widely cited in this regard – namely his political and social activities – can be characterised as actions *in favour of* Jews and not as features of a Jewish identity, and least of all as being decisive for his identity as a Jewish scientist. Even more disturbing in Charpa's view is the fact that Einstein's quasi-religious *Welt-anschauung* which plays an essential part in his concept of science turns major traditional Jewish attitudes on their head. Charpa advocates the thesis that Einstein's way of looking at science and religion is an isolated anachronism, a very specific example of "Jewishness" mirroring central ideas of mid-nine-teenth century German Reform Judaism. It was transmitted to Einstein by the prolific writer Aaron Bernstein whose books Einstein had read in his youth and about which he was still enthusiastic in his later years.

The third section focuses on Nazi Germany and the post-Nazi period, respectively, to examine the role of antisemitism in academia, though this topic enters into most of the essays.

The discussion about science and Nazi ideology has mainly focussed on "German" or "Aryan" Physics. In his contribution Aharon Loewenstein deals with an interesting but neglected international aspect to this topic, namely an article published in April 1938 by the German physicist Johannes Stark in the prominent English journal *Nature* entitled: "The Pragmatic and Dogmatic Spirit in Physics". Stark divides the world of physics into the "dogmatic" and the "pragmatic", the desired "pragmatic" sector being repre-

sented mostly by "Aryan" scientists, the undesired "dogmatic" one by Jewish scientists. Loewenstein analyses the background to the publication of this antisemitic article and the response it received from the scientific community.

Ruth Lewin Sime uses the post-war correspondence of Albert Einstein, Otto Meyerhof, and Lise Meitner with their former colleagues in Germany, Otto Hahn and Max von Laue, to analyse how some National-Socialist practices were continued after the end of the Second World War. In sharp contrast to the émigrés, Laue and Hahn played down the recent past because they regarded its memory as incompatible with their advocacy for German science and Germany and saw their émigré colleagues as permanent outsiders. Meitner and Meyerhof, sensitive to the prevailing mentality, refused offers to return to Germany.

The volume ends with a prosopographical overview by Simone Wenkel. Using a variety of sources, she gives a statistical overview of the participation of German-Jewish scientists in various fields of science and medicine in the nineteenth and twentieth centuries, and draws up an extensive list that includes names and some biographical data on German-speaking Jewish scientists and medical scientists.

London, July 2006

The Editors

Contents

Foreword	V
I. Introduction by the Editors: Problems, Phenomena, Explanatory Approaches	
– Who is a German-Jewish scientist?	3
- The Phenomena 1	5
- "Saving the Phenomena" - An Outlook on Explanatory Proposals . 3	1
II. Research Practices, Achievements, Contexts	
Ute Deichmann (London)	
Empiricism and the Discreteness of Nature:	
Ferdinand Cohn (1821–1891), the Founder of Microbiology 3	9
Anthony S. Travis (Jerusalem)	
German-Jewish Chemists and Raphael Meldola:	
The 1906 Jubilee Celebration for the Discovery of the First	
Aniline Dye	1
Moritz Epple (Frankfurt)	
An Unusual Career between Cultural and Mathematical Modernism:	
Felix Hausdorff, 1868–1942 7	7
Ute Deichmann (London)	
"I detest his way of working". Leonor Michaelis (1875–1949),	
Emil Abderhalden (1877–1950), and Jewish and non-Jewish	
Biochemists in Germany 10	1

Contens

III. The Impact of Religious and Ideological Attitudes

Raphael Falk (Jerusalem)	
Three Zionist Men of Science: Between Nature and Nurture	129
Ulrich Charpa (London)	
Aaron Bernstein's "Nächster großer Reformator" –	
Einstein, Reform Judaism, and The Fries School	155
Nurit Kirsh (Tel Aviv)	
Genetic Studies of Ethnic Communities in Israel:	
A Case of Values-Motivated Research Work	181
Yael Hashiloni-Dolev (Tel Aviv)	
German and Israeli Attitudes towards Reproductive Genetics	
and the Effect of Religion	195

IV. Anti-Semitism in Academia

Aharon Loewenstein (Haifa)	
Pragmatic and Dogmatic Physics: Antisemitism in Nature, 1938	231
Appendix: J. Stark, 'The Pragmatic and the Dogmatic Spirit in Physics'	241
Ruth Lewin Sime (Sacramento)	
No Return: Jewish Émigrés and German Scientists after the Second World War	245

V. Prosopographical Data

Simone Wenkel (Cologne)	
Jewish Scientists in German-Speaking Acadamia: An Overview	 265

Notes on Contributors	297
Index of Names	301
Index of Subjects	311

I. Introduction by the Editors

Problems, Phenomena, Explanatory Approaches

Who is a German-Jewish Scientist?

1. The Einstein case and its paradoxes

On 14 March 1929, Albert Einstein's fiftieth birthday, the Soncino-Gesellschaft der Freunde des jüdischen Buches zu Berlin (Soncino society of the friends of the Jewish book in Berlin), marked the event by publishing the booklet Gelegentliches (A Miscellany). Its thirty-two pages included pronouncements by Einstein on the relationship between science and politics, on being Jewish, and on certain prominent personalities. Some of Einstein's opinions included in the topic of "konfessionelle Traditionen" (confessional traditions) were those which he considered himself unable to accept other than in terms of historical or psychological issues.¹ Though the society of bibliophiles was enthusiastic about the "Jewish genius" the fact that they were an obscure body prevented the booklet from receiving attention. The "Soncinos" were named after Joshua Soncino, the most successful of those early printers at the end of the fifteenth century who set up Hebrew presses. His first printing in Hebrew was the first Talmud tractate, Berakhoth. It starts by tackling the question at which time one should utter the sh'ma the central tenet of the Jewish "konfessionelle Tradition". Most likely Einstein's answer to the rabbinic problem would simply have been "Never!".

While there is no need for historians of science to discuss whether or not such an answer would have caused Joshua Soncino to turn in his grave, Einstein's attitude towards his Jewishness is intriguing, particularly in view of his mythic status. Historian Shulamit Volkov observed that "If anyone may be compared with Einstein, it is two famous non-Jews"², namely Wilhelm Conrad Röntgen and Wilhelm Ostwald. Volkov makes this point in the course of her discussion on the reflections by Thorstein Veblen and others concerning the success of Jews in modern science. Volkov decided to omit Albert Einstein from her analysis of the part played by Jews in Ger-

¹ Gelegentliches von Albert Einstein, Berlin 1929, pp. 9 f.

² Shulamit Volkov, 'Jewish Scientists in Imperial Germany (Parts I and II)', in Aleph: Historical Studies in Science and Judaism, vol. 1 (2001), pp. 215–281, here p. 260.

man research institutions. Here we shall not go into the reasons for this exclusion. $^{\rm 3}$

Nevertheless, no study of the role of Jews in nineteenth and twentieth century German academia can avoid dealing with Einstein. However "atypical" we may consider him to be, according to current perceptions he is not only the representative of twentieth century science, but also the icon of a Jewish scientist. It is not by chance that Veblen, whose essay initiated the socio-historical discussion of the "intellectual pre-eminence of Jews" was fascinated by Einstein⁴ – even though the real Jewish figure in the background of his essay was probably his close friend Jacques Loeb.⁵ Moreover Volkov's assessment that "Much of what has been written about scientists in general and Jewish scientists in particular revolves, strangely enough, around this enigmatic figure."⁶ draws on the bibliographic content of the Yearbooks of the Leo Baeck Institute⁷ through the years to make her point. We concur. In comparison to the Einstein literature, relatively little has been published on Paul Ehrlich, Fritz Haber, Hermann Minkowski, Otto Stern, Richard Willstätter and other prominent Jewish scientists. There is no alternative to taking the bull by the horns – and the horns are the horns of a pragmatic dilemma:

- (Aa) Einstein is the most prominent Jewish person of the twentieth century.
- (Ab) His fame is grounded in his outstanding contribution to science.

>contrasts with<

- (Ba) Einstein would never have agreed to the thesis that being *Jewish* matters in *science*.
- (Bb) Those people who advocated the thesis that being Jewish matters in science were antisemites and opponents of his contribution to science (the representatives of *Deutsche Physik*).

³ Volkov adopts the widespread romantic idea of Einstein as isolated genius and outsider. 'Genialism' is criticised in Ulrich Charpa and Ute Deichmann, 'Jewish scientists as geniuses and epigones – scientific practices and attitudes towards them: Albert Einstein, Ferdinand Cohn, Richard Goldschmidt', in *Studia Rosenthaliana* (forthcoming). As to Röntgen and Ostwald, the story of outsiders can also be criticised for several reasons.

⁴ On this see William T. Ganley, 'A Note on the Intellectual Connection between Albert Einstein and Thorstein Veblen', in *Journal of Economic Issues* 31 (1997), pp. 245– 250.

⁵ See Charles Rasmussen and Jacques R. Tilman, *Loeb: His Science and Social Activism and Their Philosophical Foundations*, Philadelphia 1998, (chap. V: 'Loeb's influence on Thorstein Veblen'), pp. 93–121.

⁶ Volkov, 'Jewish Scientists', p. 257.

⁷ Ibid., p. 257, fn. 11.

2. On connecting science to particular individuals and groups

To commentators on science there seem to exist three possible reactions to the dilemma (that reflect in some ways Groucho Marx's paradoxical joke on his refusing to join a club that would accept him as a member). They mirror the well-known oppositions in history and philosophy of science connected to catchwords like "relativism", "objectivism", "internalism", "externalism" and so on. The three attitudes are the following:

1) Science is not an objective affair. Irrespective of whether Jews constitute a relevant and interesting sample, science is a matter of groups and it is driven by their interests. As to Einstein's objectivism, it is nothing more than a case of a philosophical self-deception on how scientific views are "fabricated". In the words of social constructivists the Theory of Relativity. "is a truth which came into being as a result of decisions about how we should live our scientific lives, and how we should license our scientific observations: it was a truth brought about by agreement to agree about new things."⁸ The usage of the word "truth" is only confusing if we consider the presuppositions held here. Said in a somewhat formal manner: to the relativist to describe a theory by a group G as true is a statement on the attitudes of G and not on the truthvalue of the theory. What is meant by the social constructivist commentators in this case is that the Theory of Relativity is neither true nor false in the traditional sense. It is interpreted, and categorically seen, as something like a castle or a flag, a product serving the specific purposes of a particular social group.

The same holds true for the level of the *meta-scientific* evaluation of a researcher's contribution. Assessing a contribution to science such as Einstein's as excellent or outstanding is socially fabricated in the same way as is science. Einstein's fame is part of the ideology that accompanies the triumph of those theoretical physicists who "defeated" their opponents. There is no objective meta-scientific criterion that would prevent historians from writing the reverse story with Philipp Lenard and Johannes Stark and other representatives of *Deutsche Physik* as "heroes".

2) Particular contexts, orientations and human factors of all kinds do not have anything to do with the quality of scientific work. If the work of a scientist can be connected to those factors it is *bad* science, as for example Lysenko's genetics in Stalin's Soviet Union. If we consider Einstein as a great researcher we should avoid speaking of him as a Jewish scientist in the strict sense of the word. Instead, it would be more correct to say that we are dealing with a scientist who in a manner of speaking is "occasionally" Jewish,

⁸ Harry Collins and Trevor Pinch, The Golem: What Everyone Should Know about Science, Cambridge 1993, p. 54.

meaning that his Jewishness is detached from his universal contribution to scientific progress. And if there are any connections between the history of science and the history of the Jews at all, there are only those such as the well-known tendency of prominent scientists to take advantage of the fame of the specialist to promote some non-scientific, in this case "Jewish", objectives.

3) The quality of scientific work can be influenced by characteristics of the individuals who carry it out. Scientific progress goes along with favourable human conditions, attitudes towards learning, being talented, being inclined to work assiduously, the existence of social surroundings that hold someone in high esteem because of his or her achievements as a researcher and so on. This does not exclude the idea of scientific truth.

Position 1) has the merits of drawing our attention to interesting topics, but the disadvantage of leading us into trouble if we have to explain the obvious superiority of some scientific views compared with others. We all share many "progressivist" intuitions, for example, the one that modern astronomy has a much *better* predictive and explanatory power than Ptolemy's system. Seen against the background of what the relativist calls the "decisions about how we should live our scientific lives" this superiority is not explicable. Even more irritating for relativists is the fact that modern astronomy is superior even according to Ptolemy's own methodological concepts.⁹

As to Relativity Theory – "our scientific life" in 2006 is vastly different from that of 1905, when Einstein's and Poincaré's first essays were published. Imperial Germany, the Berne Patent office, the French Third Republic, are long gone, but the robustness of Relativity Theory is evident. Researchers all around the world working in different social and political contexts agree on the same theory and its empirical support, a "miracle" to the relativists – and a matter of course to their opponents.

Position 2) mystifies scientific progress and collides with the "real story". Progress is modelled as a self-regulated change somehow above and beyond the heads of the scientists. But researchers are human beings, living their lives not in isolation – and, as history of science has shown, scientific change is not an *optimal* advance at every point of the research process. In many cases theories and empirical techniques that were well suited to make their super-iority evident in the long run were not necessarily the best choice from the beginning (helio-centrism was empirically seen not a well supported model of planetary motion in Copernicus's epoch).

Position 3) recommends itself as a course between that of relativism and the one pursuing the isolation of science from scientists. In sociological terms

⁹ Cf. among others, G. E. R. Lloyd, 'Saving the Appearances', in *idem, Methods and Problems in Greek Science*, Cambridge 1991, pp. 248–277.

it has already been outlined in the writings by Robert Merton, Joseph Ben-David and others. Science insofar as it turns out to be epistemically¹⁰ reliable, relevant and excellent in some other respects is not merely a social product, but a social *achievement* – it comes into being under specific, favourable conditions. Among these conditions are the availability of material things like libraries and laboratories; but the main factors are the competences of learned human beings and their will to practice them.

Why has this simple approach along the lines of our commonsense thinking about achievements not flourished and why has it apparently lost its appeal in recent decades? At the philosophical level this goes along with the development of philosophical action theory, especially the influence of authors such as Elizabeth Anscombe, Donald Davidson and Georg Henrik von Wright. Summing it up in simple terms, modern action theory starts with differentiating between action and mere behaviour and identifies "volitional" factors (motives, intentions) as being decisive in this respect. The next philosophical step is to discuss the nature of such mental states and to determine their connection to these states, such as belief. The logic of action explanations varies the elementary structure of the "Practical Syllogism": in the language of von Wright and others P does A, because P aims at B and believes A to be an adequate means to accomplish B.

This line of thinking on action and its explanation makes it easy to overlook that motives are *not* always the most *relevant* explanatory factors.¹¹ In the normal case, *achievements* – that is, actions of a good or even excellent quality compared with other actions – cannot be convincingly explained by motives. If, for example, a chess grandmaster defeats a trained amateur, this cannot be plausibly explained by his stronger will to win. According to our everyday experience, the "volitional" factor will be much more powerful for the amateur. To explain the grandmaster's achievement one has to refer to "non-volitional" factors, such as his knowledge about thousands of chess sequences, his intelligence, his prior experience and so on, in other words his *competences*.

Considering the "human factor" – that is the scientists and their capabilities – is a priority task if we are interested in understanding science, particularly scientific progress. And if there are certain individuals or groups of individuals who disproportionately contribute to scientific achievements, such

¹⁰ On the respective philosophy of science see Alvin H. Goldman, *Knowledge in a Social World*, Oxford 1999, (chap. 8, 'Science'), pp. 221–291; David Papineau, *Science and Truth*, Inaugural Lecture, King's College London 1992; Ulrich Charpa, *Wissen und Handeln*. *Grundzüge einer Forschungstheorie*, Stuttgart 2001.

¹¹ Cf. John McClure and D. J. Hilton, 'Because You Cannot always Get what You Want: When Preconditions are Better Explanations', in *British Journal of Social Psychology* 36 (1997), pp. 223–40.

as seventeenth century Jesuits¹², Merton's seventeenth and eighteenth century Protestants and nineteenth century Quakers¹³, they are worthy of documentation and discussion. The narrative of the German-Jewish scientists cannot be excluded from this project. However, as the Einstein case already indicates, there are some serious difficulties with the expressions "Jewish" and "German-Jewish" of the type which do not trouble us when we deal with Jesuits or Quakers.

3. On vague and classificatory usages of "Jewish" and "German-Jewish"

(i) "German"

For reasons historical and otherwise we start with the word that does not cause many difficulties, "German". The main two usages are complementary: according to the first, Western tradition of understanding nationality as citizenship, the term in our context would refer to people who spent at least a considerable part of their scientific lives as citizens of Imperial Germany or the Germany of the Weimar Republic. The second understanding of the concept of nation, as developed by Herder and the Romantics, plays down such "external" features and emphasises the importance of language, culture and history. In this sense many citizens of the Habsburg Empire match the concept of being "German", because among other things, the German language was their first or at least their preferred means of communication, or they shared certain "German" customs, such as for example students being members of a Burschenschaft. Both usages provide perspectives to commentators that may overlap or coexist. Speaking of a "German-Xish" person is not necessarily burdened with many difficulties. This, however, does not have to apply in every case, as for example with émigrés. The legitimacy depends on the context, that is, the respective questions we are dealing with. There are many reasons to consider someone a German scientist such as, for instance, if the person in question has held an academic position in Germany or has received his or her scientific education there. The main problem, however, occurs with the word "Jewish".

(ii) "Jewish"

The adjective "Jewish" as found in phrases such as "Jewish scientists", "Jewish physicist" and "scientists from Jewish families" varies in its meanings. At one extreme it indicates a meaning in accordance with Stark's

¹² Cf. Mordechai Feingold (ed.), Jesuit Science and the Republic of Letters, Cambridge, MA 2002.

¹³ Cf. Geoffrey Cantor, 'Quaker Responses to Darwin', in Osiris, vol. 16 (2001): *Science in Theistic Contexts*, pp. 321–342.

(Jüdische Physik) and Bieberbach's (Jüdische Mathematik) views as well as with those of other representatives of so-called "German" science. Because of this paramount association with National-Socialist constructs it is advisable not to make use of expressions like "Jewish science". Moving away from that, we might as well simply refer to those kinds of science that were carried out by people whose Jewishness was relevant, in the same sense that it is sensible to speak of Jewish handicraft in mediaeval Spain. It might be appropriate, for instance, to describe the disciplinary position of religiously distinguishable graduates. This has distinct analogies in sociological studies of science based on the demarcation of a given population i.e. the classificatory usage of "Jewish". The representation of Jewish scientists in the academic world becomes in that way a quantitative fact in need of an explanation - as for example the apparent over-achievement of Israeli mathematicians.¹⁴ However, the basis of the classification of "Jewish" persons, which is indispensable for quantitative inquiries, is still an unsettled problem in as much as it cannot refer to a group sharing the same kind of label. One manages by following conventions, for example adhering to verifiable denominations, but the problems are obvious when looking at the insufficiency of the German Biographical Dictionaries ADB and NBD classifications (see the last chapter of this volume).

The origin of these problems becomes clear if we take into consideration the fact that the relationship between the components of phrases such as "Jewish physicist" in everyday usage is far more complex than is the case with a classification. Most of our everyday predicates are *vague* which means they include a comparison. For example we speak of hard wood as opposed to soft wood – but do not consider it hard compared to steel.

Adjectives such as "German" or "Israeli" seem to take on a special or unique status; we generally interpret them as classifying. In the case of the adjective "Jewish", matters stand differently: it is not established whether phrases such as "Jewish scientist" or "Jewish families" mark an *intersection between the set of scientists and that of Jews*. Matching other everyday phrases leads us to position an entity called Jew in a quasi-series, for example describing a certain building as a house. This alternative can be found again at the level of the usage of nouns. The English language offers two substantival matches for the expression "Jewish"¹⁵:

¹⁴ Thomas Schøtt, 'Scientific productivity and international integration of small countries: Mathematics in Denmark and Israel', in *Minerva* 25 (1987), pp. 3–20.

¹⁵ The Hebrew word 'yehudi' has an adjectival as well as a substantival usage.

- (A) "Jew" or "Jews"¹⁶
- (B) "Jewishness" ("Yiddischkejt"¹⁷ in Yiddish)¹⁸

Case (A) is connected to a predominantly classificatory usage. Divergences, that is the vague usage (which can be traced, among others, to Maimonides), will be dealt with later. Case (B) demands a *vague*, that is consequentially seen, comparative usage to maintain plausibility. In line with the classificatory usage of (A) someone is *either* Jewish *or* not; the vague use of (B) characterises a person as being *more or less* a Jew or Jewish, respectively. How both usages of "Jewish" allow or exclude phrases like "the Jewish contribution to science" will be discussed in the following.

(iii) The classificatory usage of "Jewish" and "Jew", respectively

Classifying a person as "Jewish", and respectively as a Jew, is a linguistic practice found in a multitude of more or less everyday contexts, such as the ordinary registration of parishioners. With the current context of discourse in mind, the two relevant classificatory usages are: the halakhic classification and the National-Socialist one.

The National-Socialist classification

National-Socialist classifications characterised certain individuals as "full Jews", "half Jews", "half-castes of first and second class", and as "three-eighth-Jews" (Globke), which in many cases even led to confusion among National Socialists themselves.¹⁹ Despite the fact that these classifications now seem quite strange, one must not ignore the fact that they are absolutely relevant for contemporary scientific historical research, since certain biographical phenomena can only be explained by the nature of these National-Socialist classifications: it may be that a "three-quarter-Jew" as defined by National-Socialist terminology cannot – from the halakhic perspective – count as a Jew at all. Curt Herzstark is a case in point. He was a computer-pioneer, whose "ethnicity" appears far more comprehensible if a National-Socialist approach is

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¹⁶ In Hebrew this usage would match relating someone to *am yisrael* or *yahadut*.

¹⁷ Somewhat differing from this appraisal as vague expression referring to a personality feature is Jacob Neusner, 'Defining Judaism' in *idem* and A. J. Avery-Peck, *The Blackwell Reader to Judaism*, Oxford 2001, pp. 3–18, here p. 4, who obviously acknowledges the specificity of the Yiddish expression ("refers more specifically to the folk elements of the faith"), but nevertheless identifies it with Judaism.

¹⁸ There is no analogue in modern Hebrew. It follows the categorical vocabulary of the old language. One could perhaps coin something like "*yehudiyut*" in order to express what at best is paraphrased as "*be-zurah yehudit*" ("in a Jewish way"). One should perhaps note that there is also an English usage of "*Yiddishkejt*" that is neglected here.

¹⁹ An overview on this is given in Jeremy Noakes, 'The Development of Nazi Policy towards the German-Jewish "Mischlinge" 1933–1945', in *LBI Year Book*, vol. 34 (1989), pp. 291–354.

Index of Names

Abderhalden, Emil VII, 101-126 Abel, Emil 22 Adam, Avinoam 184, 188, 189, 192 Albright, Madeleine 12 Almog, Oz 186 Alter, Georg 271 Amichay-Michlin, Dania 132 Amir, A. 188 Amir, Delila 205 Anscombe, Elizabeth 7 Appiah, Kwame Anthony 32 Arendt, Hannah 261 Aristotle 178 Armytage, Walter H. G. 234 Armstrong, Edward 65 Arrhenius, Svante 28 Aschheim, Steven G. 84, 98 Ashkenazi, Israel 186, 189, 192 Avenarius, Richard 82 Avery, Oswald T. 25, 27 Avery-Peck, Alan J. 10 Bacon, Francis 154 Baeyer, Adolf von 17, 22, 24, 53, 54, 56, 57, 58, 70, 71, 72, 121 Bahr-Bergius, Eva von 254, 260 Baker Tristram, Henry 150 Barak, Elisheva 188 Barilan, Yedriel 204, 210 Barkan, Elazar 138 Barnes, Jonathan 14 Bassett, William M. 210 Bates, Henry Walter 65 Bateson, William 138 Baumann, Zygmund 213 Baumler, Ernest 40 Baur, Erwin 29, 148 Bayani-Sioson, P. 191 Bechhold, Heinrich 41

Beck, Ulrich 212, 213 Behring, Emil von 17 Beijerinck, Martinus Willem 47 Ben-David, Joseph 7, 117 Benfey, Hans 64 Benfey, Hedwig 64 Benfey, Otto Theodor 64 Benfey, Philipp 64 Benfey, Theodor 64 Benjamin, Walter 162 Ben-Menahem, Yemima 193 Ben-Rafael. Zion 220 Berliner, Arnold 123 Bergmann, Ernst David 119 Bergmann, Max 23, 117, 119, 120 Bernard, Claude 34 Bernstein, Aaron 155-180 Bernstein, Jeremy 248, 250 Bernstein, Julius 170 Bernthsen, August 72 Bessel, Friedrich Wilhelm 169, 176, 177 Beveridge, William H. 233 Beyerchen, Alan D. 232 Biagoli, Mario 159 Bieberbach, Ludwig 9 Billroth, Theodor 34, 47 Blau, Marietta 261 Blecher, J. D. 203 Bloch, Konrad 120 Bloch, Nava 184 Boas, Franz 237 Boaz, Hagai 195 Bodenheimer, Fritz Shimon VII, 129-154 Bodenheimer, Max 148 Boeckh, August 162, 167, 171, 175 Börner-Klein, Dagmar 168, 171 Bohr, Niels 27, 238 Boltanski, Luc 222, 226

Index of Names

Bondi, Ruth 183 Bonne, Batsheva 183 Born, Max 26, 27, 158, 233, 243, 245 Bornstein, A. 120 Boyes, J.W. 193 Brahn, Max 98 Bredig, Gustav 22 Brenner, Sidney 3, 27, 30 Breslauer, Bernhard 265, 266 Bridges, Calvin B. 28 Brieskorn, Egbert 77, 79 Brock, Thomas D. 40 Bruns, Heinrich 79, 81 Büchner, Ludwig 161 Bunge, Gustav von 112, 115 Butenandt, Adolf 121 Butler, Arthur G. 65 Buxton, Patrick Alfred 149 Bychowski, Shneor Zalman VII, 129-154 Cahill, Lisa Sowl 203 Campbell, Philip 239 Cantor, Geoffrey 8, 137 Cantor, Georg 85, 90 Caro, Heinrich 52-59, 61-73, 79 Cassidy, David C. 247 Cassirer, Ernst 161 Chain, Ernst Boris 122 Chamberlain, Joseph 142 Chamberlain, Neville 231 Chamisso, Adalbert von 172 Charcot, Jean-Martin 132 Chargaff, Erwin 27 Charles. Daniel 16 Charpa, Ulrich 4, 7, 15, 29, 33, 47, 69, 78, 95, 96, 105, 106, 114, 156, 159, 162, 166, 168 Chatterji, Shristi D. 82 Chemke, Juan M. 201 Chmielnicki, Bogdan 153 Cohen, Hermann 82, 161 Cohen, Maurie J. 202 Cohen, Paul 90 Cohen, Tirza 184, 188, 189 Cohn, Ferdinand VI, 26, 29, 39-50 Cohnheim, Julius 48 Collins, Harry 5

Connery, John 203 Copernicus, Nicolaus 6, 238 Correns, Carl 28 Courant, Richard 80 Crick, Francis 27 Crookes, William 65 Cunningham, Andrew163 Darwin, Charles 48, 49, 65 Davenport, Charles B. 138 Davidson, Donald 7 Davis, Ella Frederica 65 De Broglie, Louis 26 Debve, Peter 247 Deichmann, Ute 4, 15, 18, 20, 22, 23, 26, 29, 47, 51, 101, 105, 110, 117, 121, 156, 193, 195, 231, 254, 258, 267, 272 Delbrück. Max 27 Deutsch, H. 120 De Vries, Hugo 28 Diepgen, Paul 43 Dietrich, Donald J. 210 Dilthey, Wilhelm 161 Dingler, Hugo 156 Dirac, Paul A. M. 238 Dithmar, Christian 164 Dixon. Bernard 214 Dobzhansky, Theodosius 150 Dörries. Matthias 250 Dove. Heinrich Wilhelm 169 Dreyfuß, Alfred 64 Dreyfuß, Charles 64 Dreyfuß, Sylvain 64 Du Bois-Reymond Paul 177 Dühring, Eugen 156 Duhem, Pierre 31 Duisberg, Carl 72 Dunn, Leslie C. 150 Dyson, Freeman 27 Efron, John M. 18, 121, 137, 141, 192 Ehrenberg, Christian Gottfried 46 Ehrenberg, S. M. 168 Ehrlich, Paul 4, 17, 25, 29, 40, 61, 104, 111, 116, 117, 120, 122, 161 Eichendorff, Joseph von 172 Eichhorn, Eugen 77, 79 Einstein, Albert VIII, IX, 3-6, 24, 26,

302

27, 123, 155–180, 233, 234, 236–239, 243-245, 247, 252, 253 Einstein, Hermann 176 Eisenstadt, Shmuel N. 186 Eisler, Rudolf 161 Emden, Gustav 117 Endelman, Todd M. 138, 146, 147 Engel, Friedrich 80 Engelmann, Theodor W. 118 Engler, Karl 17 Epple, Moritz VIII, 78, 86, 89, 91 Epstein, Emil 120 Erikson, Susan L. 197 Erlanger, Bernard F. 110 Escherich, Karl 149 Eve, Arthur S. 237, 238 Ewald, Peter Paul 245 Fajans, Kasimir 22 Falk, Raphael VII, 32, 137, 142, 144 Faraday, Michael Farkas, Ladislaus 119 Fechner, Gustav Theodor 82 Feingold, Mordechai 8 Feldman, David M. 203 Ferreiros, José 78 Feuer, Lewis S. 32 Feuerbach, Ludwig Feynman, Richard 27 Fichte, Johann G. 237 Fiedler, Leslie 217 Firestone, Ofen 214 Fisch, Menahem 35 Fischer, Emil 17, 22, 23, 27, 56, 62, 104, 105, 110, 111, 115, 117, 118, 121, 122 Fischer, Eugen 148 Fischer, Hans 121 Fischer, Klaus 20 Fischer, Otto 56, 62 Fisher, Ronald A. Fishberg, Maurice 140, 145, 146 Fletcher, John 195, 223 Florkin, Marcel 111 Foerster-Nietzsche, Elisabeth 83 Forman, Paul 245 Fox, Robert 64 Fraenkel, Abraham 90 Fränkel, Ernst 120

Franck, James 233, 257 Frank, Charles 248, 250, 251 Frankland, Edward 59 Franklin, Rosalind 27 Frayn, Michael 250 Frei, Norbert 260 Frenkel, Michal 195, 196, 222 Frenkel, Yacov 233 Freud, Sigmund 132 Freudenthal, Gad V, 35 Freund, Ernst 120 Freund, Richard 120 Fried, C. 120 Fried, K. 191 Friedemann, Ulrich 41 Friedenwald, Harry 18, 121, 122 Fries, Jakob Friedrich 162-173 Frölich, Jürgen 175, 176 Fruton, Joseph 110, 112, 118 Funkenstein, Amos 178 Galilei, Galileo 159, 238, 244 Galton, Francis 130 Ganley, William T. 4 Gans, Leo 61 Gardner, Walter M. 67 Gauss, Carl Friedrich 162 Gay, Peter 82 Geiger, Hans 17 Geiger, Ludwig 168 Geldsetzer, Lutz 163, 171 Giraud, Albert 83 Glatzer, Nahum 168 Goethe, Johann Wolfgang 84, 98 Goldberg, David T. Goldman, Alvin 7 Goldschmidt, Abraham M. 79 Goldschmidt, Elisabeth VIII, 181, 184-186, 188, 191, 193 Goldschmidt, Henriette 79 Goldschmidt, Richard 4, 20, 28, 29 Goldstein, Jan 132 Golomb, Jacob 84, 96 Göppert, Johann H. R. 43 Gooldin, Sigal 195 Goudsmit, M. E. 120 Gould, Stephen Jay 29, 30 Graebe, Carl 53, 56, 57, 73

Graetz, Heinrich 36, 163, 164, 169 Granick, Sam 115 Gray, Jeremy J. 78 Gregory, Frederick 173, 174, 177 Gregory, Richard 234, 235, 239, 240 Gruber, Max 50 Gruendel, Johannes 219 Guggenheim, Hans 120 Gumpert, Alfred Joseph Gumpert, Martin 271 Gurevitch, Aron 98 Gurevitch, Joseph 8, 181, 182, 183, 185, 187-189, 192 Gutman, Jacob 120 Guzman Barron, E. S. 108, 109 Haber, Fritz 4, 15, 16, 17, 22, 24, 28, 119, 123, 161, 249, 259 Haber, Siegfried 15 Haeckel, Ernst 17, 149, 161 Hahn, Otto IX, 17, 245-261 Haldane, John B. S. 29 Halpern, J. 120 Hansen, Friedrich 40 Hanson, Horst 113 Hart, Mitchell B. 137, 140 Hartleben, Otto Erich 83 Harwood, Jonathan 101, 102, 103, 126 Hashiloni-Dolev, Yael VIII, 196, 198, 202, 210, 222 Hasson, E. 183, 187, 191 Haurowitz, Felix 122 Hausdorff, Felix VII, 77-99 Hausdorff, Hedwig 79 Hausdorff, Lotte 79 Hausdorff, Louis 79 Hegel, Georg W. F. 161, 162, 168, 173, 176.237 Heidelberger, Michael 25 Heil, Karl W. 193 Heimann, Fritz 120 Heisenberg, Werner 27, 234, 236, 243, 248, 250 Helmholtz, Hermann von 34 Henle, Jacob 18, 26, 39, 162 Hentschel, Klaus 233, 252, 259, 260 Herder, Johann Gottfried 8, 149 Hermoni, D. 183, 189, 191

Herschel, John F. W. 34 Hertwig, Oskar 104 Hertz, Gustav 17, 24 Hertz, Richard 120 Herzl, Theodor 129, 130 Herzog, Reginald 22 Herzstark, Curt 10 Hevesy, Georg von 22 Hevd, David 196 Hilbert, David 92 Hill, Archibald V. 117, 232, 233, 239, 240 Hilton, D. J. 7 Hirsch, Paul 120 Hochkirchen, Thomas 82 Hoffmann, Dieter 245 Hoffmann, Ernst Th. A. 172 Hoffmann, Roald 21, 179 Hofman, August Wilhelm 27, 53, 71 Hofmann, Eberhard 116 Holdheim, Samuel 165, 174 Hollinger, David A. 33 Holton, Gerald 158 Hoppe, Brigitte 43 Hörlein, Heinrich 257 Hubmann, Gerald 163 Hughes, Thomas P. 156 Inge, W. R. 210 Ivry, Tsipy 198 Jacob, Francois 27 Jacoby, Gustav 109 Jakobovits, Immanuel 203, 204, 209, 210 James, Walter J. 211 James, William 166 Jammer, Max 158, 160 Jardine, Nicholas 163 Johannsen, Wilhelm 28 Johnson, Jeffrey A. 22 Johnston, Sir Harry 142 Jonas, W. 120 Jordan, Pascual 26, 243 Joseph, Alfred 265 Kaasch, Michael 105, 110, 113, 115 Kafka, V. 120

Kallmann, Hartmut 259 Kalmus, Hans 188, 270 Kampe, Norbert 19 Kant, Immanuel 85, 87, 159, 163-165, 170, 171, 173 Kantorowicz, Richard 271 Kaplan, Amid 195 Karlik, Berta 261 Kasher, Asa 14 Kaznelson, Siegmund 21, 267 Kekulé, August 27, 57, 58 Keller, Gottfried 84 Keller, Rudolf 271 Kellner, Menachem 11, 12, 35, 160 Kennedy, Eugene P. 125 Kersting-Wilmsmeyer, Andreas 220 Kessel, Barbara 12 Kirsh, Nurit VIII, 32, 181, 185, 187 Klein, Felix 17, 80, 81 Kleinert, Andreas 231, 232, 237 Klingemann, Felix 73 Klinger, Max Knoop, Franz 117, 120, 121 Koch, Lene 208 Koch, Robert 26, 29, 40, 44-50, 161 Koenig, Gert 163, 171 Kohan, Zully 223 Kohler, Robert 124 Kohn, Hans 192 Kolmogorov, Andrei N. 82 Koppel, Leopold 23 Krebs, Hans 25, 117, 120, 122-125 Kreim, Yoav 220, 221 Krochmalnik, Daniel 84 Krones, Tanja 197, 202, 214, 222 Kuhn, Paul 271 Kuhn, Richard 121 Kümmel, Werner 18, 121 Ladd, Everett 32 Lagermarck, L. von 106-108 Landau, Lev 233 Landsteiner, Karl 39, 41, 50, 113, 116, 120, 122, 126, 183 Latour, Bruno 199 Laue, Max von IX, 245-261 Laue, Theodor von 246-248 Lauterbach, Kurt 84

Lavi, Shari 195 Lederberg, Esther 27 Lederberg, Joshua 27, 43, 50 Lederer, Otto W. 120 Leibowitz, Shira 21, 179 Leibowitz, Yeshayahu 35 Lemmerich, Jost 248 Lenard, Philipp 5, 17, 232, 236, 239, 240, 242-244 Lenz, Fritz 148 Leonhardt, August 55, 61, 73 Lerner, Michael 193 Levin, Gershon 131 Levine, Ona 188 Levinstein, Ivan, 74 Levy, Johann 120 Lewontin, Richard 39 Lichtheim, Ludwig 48 Lie, Sophus 80 Liebermann, Carl 27, 53, 56, 57, 61, 72, 73 Liebig, Justus von 27 Liebmann, Heinrich 81, 82, 85 Liebmann, Otto 81, 82, 85 Liliencron, Rochus von 267 Link, Heinrich Friedrich 162, 169 Linke, Uli 212 Linné, Carl 46 Lipmann, Fritz 25, 17, 122, 123 Lipset, Seymour 32 Loeb, Jacques 4, 20, 29, 107, 112, 113, 116, 120, 122, 123 Loeb, L. 120 Loewenstein, Aharon VIII, IX, 102 Lori, Aviva 221 Lowry, Otto 120 Luria, Salvador 27 Luschan, Felix von 146 Lustig, Ernst 271 Luther, Martin 166 Lwoff, André 124 Lynen, Feodor 121 Lyth, Ofra Y.233 Maddox, Brenda 239 Maddox, John 239 Magnus, Gustav Heinrich 18

Maier, Helmut 247

Index of Names

Maimonides 10, 11, 13 Margolis, E. 183, 187, 189, 191 Mark, Hermann 22, 28 Marx, Groucho 5 Marx, Zvi 216, 217 Matoth, Y. 184, 188 Mattauch, Josef 252 Matthaei. Heinrich 27 Mauthner, Fritz 83 Maxwell, James C. 238 Mayer, August 120 Mayer, Gustav Adolf 81 Mayer, Karl 122 Mayer, Wilhelm 120 Mazumdar, Pauline M. H. 41, 45, 46, 50, 111, 113, 119 McClure, John 7 McEwan, Hilary 51 Medawar, Jean 231, 233 Mehrtens, Herbert 77, 91 Meitner, Lise IX, 23, 245-261 Melamed, Shoham 198 Meldola, Raphael VI, 29, 51-75 Meldola, Samuel 59 Mendel, Bruno 123 Mendel, Gregor 28 Mendelssohn, Moses 172, 173 Menten, Maud 104, 105, 115 Merton, Robert K. 7, 8 Meselson, Matthew 27 Meyer Goldschmidt, Abraham 79 Meyer, Heinrich 55, 56 Meyer, Kurt H. 28, 119, 122 Meyer, Michael A.16 Meyer, Stefan 261 Meyer, Victor 22, 27, 55 Meyerhof, Otto IX, 19, 25, 116, 117, 120, 123, 124, 126, 163, 232, 245, 253-256, 258 Michaelis, Eva 103 Michaelis, Leonor VII, 19, 21, 101-126 Michaelis, Moritz 103 Milbank, John 221 Minkowski, Hermann 4 Mongré, Paul - s. Hausdorff, Felix Monod, Jacques 27 Morag-Levine, Noga 203 Morgan, Thomas Hunt 28

Morris, Peter J. T. 71 Mosse, George L. 78, 93, 95 Mosse, Werner E. 78, 93, 98 Moul, Margaret 144 Moulton, Frederick R. 231 Mourant, A.E. 191 Muller, Hermann J. 28 Müller, Johannes Peter 42 Müller, Wilhelm 234 Müller-Hill, Benno 105, 195 Mundel, G. 183 Mushaben, Joyce 206 Nachtsheim, Hans 29 Nachmansohn, David 122 Nägeli, Carl Wilhelm von 45, 46, 50 Navon, Liora 217 Neel, James T. 193 Neimann, I. M. 131 Neisser, Max 41 Nelson, Leonard 163 Nernst, Walther 17, 28 Neuberg, Carl 25, 116, 117, 122, 124 Neumann, Carl 81 Neumann, John von 80 Neusner, Jacob 10, 11 Newton, Isaac 238, 244 Nietzsche, Friedrich 82, 83, 87, 88, 95, 98 Nippert, Irmgard 195, 208 Nirenberg, Marshall 27 Noakes, Jeremy 10 Oexle, Otto Gerhard 252 Olitsky, L. 182 Osborn, Henry Fairfield 138 Ossietzky, Carl von 234 Ostwald, Wilhelm 3, 17, 28 Ostwald, Wolfgang 112, 123 Otto-Peters, Luise 79 Papineau, David 7 Pasteur, Louis 26 Paucker, Arnold 82 Paul, Diane B. 208 Pauli, Wolfgang 20, 27, 119, 120 Pauling, Linus 112 Paulsen, Friedrich 82

306

Pauly, Philip J. 21 Pearl, Raymond 150 Pearson, Karl 144 Perkin, William 51-53, 56, 59, 65, 71-73 Pettenkofer, Max von 40, 50 Pinch, Trevor 5 Pinn, Carl 270 Planck, Max 17, 234 Poincaré, Henri 6, 156 Poliakoff, C. 187 Politzer, Charlotte 270 Popper, Karl 35, 163, 169 Prainsack, Barbara 210, 214 Preston, David L. 32 Price, Janet 207 Pringsheim, Hans 119 Ptolemy 6 Pulte, Helmut 162 Purkert, Walter 88, 90, 91 Pyka, Marcus 169 Pyke, David 231, 233 Rabino, Isaac 214 Rabinow, Paul 199 Rabkin, Yakov 18, 32 Rahaman, Gabriele V, 129 Rammer, Gerhard 252 Ramot, Bracha 189, 191 Ramsay, William 65 Rapp, Rayna 206, 226 Rasmussen, Charles 4 Raz, Aviad 197, 221 Rebenstein, A. (see Bernstein, Aaron) Rée, Paul 98 Rehder. Marie-Luise 253 Reich, Warren T. 202 Reinhardt, Carsten 18, 55, 63, 66, 71 Resnik, Julia 222 Reissner, Hanns G. 163 Remak, Robert 20, 29, 44 Remeick, Larissa 197 Rhodes, Richard 231 Richarz, Monika 16 Richter. Gerd 197, 202, 222 Richter, Raoul 98 Riemann, Georg 88 Riesz, Friedrich 90

Ringer, Fritz K. 32 Ringmann, Ursula 253 Rittner, T. H. 251 Robinson, Ira 18, 32 Rocke, Alan J. 18 Rodrigue, Aron Roelcke, Volker 187 Röntgen, Wilhelm Conrad 3, 17 Rona, Peter 123 Roscoe, Henry 65 Rosen, Felix 43, 48 Rosenberg, Alfred Rosenthal, Felix 120 Rosin, David 36 Rosner, Robert 261 Roth, Cecil 139 Roth, Siegfried 108 Rothschild, Walter 65 Rubinstein, M. 120 Rubner, Max 17 Rübesamen, Hans E. 61 Rutherford, Ernest 236-38, 241-244 Salaman, Brenda Z.138 Salaman, Nina 138 Salaman, Redcliffe Nathan VII, 129-154 Salomon, Gotthold 163 Sambursky, Shmuel 193 Sandor A. 191 Sanger, Frederick 110 Schelling, Friedrich W. J. 176, 177, 237 Schlegel, Christina 202 Schleiden, Matthias Jakob 33-36, 43, 46, 47, 162, 166-168, 173, 176, 177 Schleiermacher, Friedrich 170-172 Schlick, Moritz 89 Schmiedebach, Heinz-Peter 44 Scholz, Erhard 90 Schönberg, Arnold 83 Schönheimer, Rudolf 25, 120-122, 125 Schoeps, Julius H 174, 176 Schopenhauer, Arthur 82 Schorsch, Ismar 166, 167 Schøtt, Thomas 9 Schrödinger, Erwin 233, 236, 243 Schröter, Harm S. 64, 70

Schüring, Michael 259 Schultz, Gustav 64 Schultz, James 194 Schur, Friedrich 81 Schwann, Theodor 43 Schwarz, Henry 120 Schwarzschild, Steven 35 Schweber, Silvan S. 27 Schwinger, Julian 27 Seligman, Charles G. Sheba, Chaim VIII, 181-194 Shenshav, Yehuda 199 Sher, Carron 198 Shildrick, Margrit 207 Sieg, Ulrich 82 Siegel, Gil 210 Siegmund - Schultze, Reinhard 80 Siemer, Stefan 156 Sime, Ruth Lewin V, IX, 245, 247-251, 261 Simon, Franz 22 Sinnott, Edmund W. 150 Skolem, Thoralf 90 Slonimsky, Chaim Selig 174 Smith, Kenneth M. 138 Smith, Watson 59 Sörensen, Sören 112 Sokol, Moshe Z. 160 Sommerfeld, Arnold 234, 243 Soncino, Joshua 3 Speyer, Franziska Spinoza, Baruch 156, 158, 159 Stachel, John 155 Stahl, Franklin 22 Stahl, Hadrian 271 Stark, Johannes VIII, 5, 8, 232-244 Staudinger, Hermann 28 Stegmaier, Werner 75, 83, 84 Steinberg, Abraham 201, 204, 219 Steinschneider, Moritz 167 Stenhouse, John 59 Stern, Curt 28, 29 Stern, Otto 4, 21 Sternschuß, Josua 173 Stirner, Max 84 Stolberg-Wernigerode, Otto Graf zu 267Stoltzenberg, Dietrich 16

Stone, Dan 138 Strassmann, Fritz 259 Stratton, Frederic J. M. 234 Strohmeier, Brigitte 261 Sturtevant, Alfred H. 28 Stybel, Abraham Joseph 32 Summers, William C. 43, 44 Sutton, H. E. 191 Swetlitz, Marc 137 Szabo, M. A. 188 Szeinberg, Aryeh 186, 189, 191 Szöllösi-Janze, Margit 16 Talmey, Max 174 Tatum, Edward 27 Teller, Edward 21 Ter Meer, Fritz 259 Theilhaber, Felix A. 271 Thévenot, Laurent 222 Thieberger, Reuben 271 Thiele, Ernst - Jochen 77, 79 Thüring, Bruno 156 Tietz, Hedwig 79 Tilman, R. 4 Titze, Hermann 80 Tomonaga, Sin-Itiro 27 Traube, Moritz 45 Traube, Wilhelm 249, 250 Trautmann-Weller, Céline 167, 169 Travis, Anthony S. V, VI, 18, 20, 29, 53, 54, 64, 68, 70, 71, 73, 101, 119 Trimen, Roland 65 Tschermak-Seysenegg, Erich 28 Tschuratkover, S. 146 Uhland, Ludwig 172 Ucko, Siegfried 163 Van Bekkum, Wout J. 167 Van Slyke, Donald D. 106 Van't Hoff, Jacobus Henricus 28 Vardimon, David 220 Vaupel, Elisabeth 56 Veblen, Thorstein 3, 4, 31, 32, 95 Veltri, Guiseppe 171 Virchow, Rudolf 18, 44, 122 Volkov, Shulamit V, 3, 4, 10, 16, 18, 32, 33, 78, 94-97

308

Wagner, Richard 82, 84 Wahrman, Jacob 129 Wahrman, Miryam 211 Waldeyer, Wilhelm 40 Walker, Mark 232, 245, 250 Wallace, Alfred Russell 65 Wallach, Otto 22, 24, 27 Warburg, Emil 25 Warburg, Otto 25, 26, 116, 120, 122, 124 Warschauer, Adolf 82 Wassermann, August von 17 Watson, James 27 Weber, Heinrich Friedrich 178 Wegele, Franz Xaver 267 Weigert, Carl 39, 42, 148 Weil, Jacob 164 Weinberg, Arthur 61 Weinberg, Wilhelm 29 Weismann, August 65, 66 Weiss, Yfaat 193 Weiß, Eugen 120 Weissenberg, Richard 111 Weissenberg, Samuel 139 Weizsäcker, Ernst von 257 Wenkel, Simone IX, 19 Wertheimer, Franz 119 Wertz, Dorothy 195, 196, 223 Wette, Wilhelm L. de 167-169, 171 Weyl, Hermann 80 Wieland, Heinrich 121 Wien, Wilhelm 17 Wigner, Eugene 21

Wildung Harrison, Beverley 202 Wilkins, Maurice 27 Willstätter, Richard 4, 22-24, 119, 121, 271 Windaus, Adolf 121 Winogradski, Sergei N. 47 Witt, Otto N. 57 Wolf, Immanuel 163-165, 169 Wolff, Gerhard 195, 208 Wolff, Stefan 19, 20, 23, 259 Wolfsohn, Georg 120 Wright, Georg Henrik von 7 Wright, Sewall 29 Wundt, Wilhelm 82 Wurtz, Adolphe 27 Wuerth, Andrea 205 Yishai, Yael 203 Younovitch, Rene 183 Zangwill, Israel 65 Zermelo, Ernst 90 Zilberstein, V. 182 Zimmermann, Mirjam 219 Zimmermann, Ruben 219 Zimmern, Siegmund Wilhelm 163-165, 169 Zinzendorf, Nikolaus Ludwig von 164 Zohar, Noam 209 Zuckerman, Harriet 50

Zunz, Leopold 163, 167, 168, 170, 171, 175

Index of Subjects

'Abwehrfermente' 105-107, 114 acting vs. thinking 158-160 AGFA 64, 73 Ahnung 158, 170-172, 180 Akademisch philosophischer Verein 82, 83 Aleph V alienation 32 Allgemeine Deutsche Biographie / Neue Deutsche Biographie 8, 265–298 antisemitism VII, 19, 33, 42, 96, 126, 156, 163, 193, 231-244 analysis, mathematical 91 anthropology 138, 139 ashkenazi VIII, 141, 153, 181, 185-187, 193 assimilation 96 axiomatics, mathematical 91-93

BASF 16, 53, 55–58, 66–68, 70, 72, 74 basic vs. applied research 113 Bayer Company 72 biochemistry 101–126 British Chemical Society V, 51 British Society of Dyers and Colourists 73 BS&S 59, 60, 63, 68

Chemical Society 64 CIBA 64 competences (as explanatory factors) 7, 33, 121 constructivism 5 conversion 11, 12, 18 'creative niche' 26, 32 Darwinism 48, 65, 142, 143, 147 'defence enzymes' see 'Abwehrfermente' Deutsche Demokratische Partei 80 Deutsche Forschungsgemeinschaft 16 'Deutsche Physik' VIII, 4, 5, 231–244, 247 disproportional achievements of Jews 23–30 Einstein-dilemma 4 emigration 101, 126, 245–262 Enlightenment 79, 98, 79, 98, 159, 161, 162 epigonism 156 eugenics VIII, 129, 134, 136, 141, 143, 153, 195, 198, 208–211 explanation of scientific actions 7, 13 externalism 5

Farm Hall 248, 249–151, 254 Frankfurter Anilin-Fabrik Gans & Co. 61, 63 Friedrich's disease 134 Fries School 155–180

genetic counselling 195–227 genetics VIII, 5, 137, 181–194, 198 genialism 156 genius, concept of 3 *Geopedizin* 40 *Geopolitik* 151 German, concept of 8 German-Jewish, concept of 8–15

Habilitation 79 Haeckel movement 149, 154, 161 Hegelianism 162, 163, 168 historical-critical method 157, 167 IG Farben 257, 258

Institute of Chemistry of Great Britain and Ireland 64 Institut für Serumsforschung und -prüfung 40 internalism 5

Index of Subjects

Jesuits 8 Jewish (classificatory usage of the concept) 10-13 Jewish (vague usage of the concept) Jewish, concept of (with regard to science) 4, 5-15, 155-157, 201 Jewish, concept of 8-15 Jewish, halakhic concept of 11, 12 Jewish, national social concept of 10, 11 'Jewishness' VIII, 32, 157, 161, 201 'Jüdische Physik' 8, 56, 41, 101, 231–244 Kaiser Wilhelm Institutes 41, 123, 124, 247, 252, 253, 259 Kantianism 81, 82, 85, 162, 165, 170, 173 kohanim 140 Law of Return 193 Leo Baeck Institute V, 4 Leopold Cassella 61, 79 Leopoldina 104 Lysenkoism 5 Maccabeans 71 marginalisation thesis 97 marxism 82 Merton thesis 7, 8 Michaelis constant 104 miracle argument 6 models (explanatory) 7, 33 modernism 97 natural theology 158-160 Nature VIII, 231-244 Naturphilosophie (romantic) 168, 169, 178 Neo-Kantianism 81 networking 123 Neue Deutsche Rundschau 89 Nietzscheanism 82-85, 87-89, 96, 98 Nobel prizes 15, 17, 23-25, 41 objectivism (with regard to science) 5, 6, 155 **ORT 164** over-representation of Jews in science 9, 18 - 23

Popperianism 35 Practical Syllogism 7 Privatdozenten 79, 81, 96 progress, scientific 6-8, 212-215 Quakers 8 Reform Judaism 12, 161-180 relativism (with regard to science) 5, 155 Relativity Theory 5, 6, 155 reliabilism 6 religion V, VIII **Rockefeller Institute 41** role models 122, 123 Royal College of Chemistry 53 Royal Institute 72 Schleiden thesis 33-36 Science Dinner 71 Sephardi VIII, 59, 141, 142, 153, 181, 185-187, 191 set theory 77, 88, 90-92 Simon Dubnow Institute V Soncino Gesellschaft 3 styles, scientific 102, 103, 123, 126 Talmud 11, 12, 21, 30, 41, 42, 49, 79, 160, 179, 180, 204 taxonomy 43-46, 49 thinking (Einstein on) Veblen thesis 3, 4, 31, 32, 95 Verein deutscher Chemiker 72, 72 Verein für Kultur und Wissenschaft der Juden 163 Verein zur Beförderung der Handwerke unter den Juden 164 Volkov thesis 92 Wandering Jew' 132, 135 Weisse Juden' 233, 234, 239, Weltanschaung 158, 161 Wissenschaft des Judentums 141, 157, 163, 166-171, 178 Wissenschaftszirkel 163 Zionism VII, 129–154, 181–194, 222

Schriftenreihe wissenschaftlicher Abhandlungen des Leo Baeck Instituts

Alphabetical Index

- Adler-Rudel, Scholem: Jüdische Selbsthilfe unter dem Naziregime 1933–1939 im Spiegel der Berichte der Reichsvertretung der Juden in Deutschland. 1974. Volume 29.
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